West Sussex County Council and South Downs National Park Authority

Joint Minerals Local Plan Single Issue Soft Sand Review

Regulation 19

Habitats Regulations Assessment Main Report

Prepared by West Sussex County Council and the South Downs National Park Authority

September 2019

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1. Introduction

1.1 This Habitats Regulations Assessment Report has been prepared by West Sussex County Council and the South Downs National Park Authority (SDNPA) for the Single Issue Soft Sand Review (SSR) which will form part of the West Sussex and South Downs National Park Joint Minerals Local Plan (hereafter referred to as the JMLP).

1.2 This report supports the Single Issue Soft Sand Review, Proposed Submission draft Regulation 19 document. This HRA report reviews and updates the HRA for the JMLP prepared by AECOM and published in 2016. This report has been prepared to be read as a stand-alone document for the SSR however the HRA for the JMLP is available for viewing, and can be referenced for further context and for HRA information about the other elements of the JMLP.

Scope of the JMLP and SIR

1.3 As mineral planning authorities, West Sussex County Council (WSCC) and the South Downs National Park Authority (SDNPA) ('the Authorities') are required to plan for a steady and adequate supply of minerals in accordance with paragraph 207 of the National Planning Policy Framework 2019 (NPPF).

1.4 The JMLP was jointly prepared and adopted by the Authorities in July 2018. The Plan sets out strategic policies for a number of different types of mineral for the period to 2033 to ensure that a steady and adequate supply can be maintained.

1.5 During the examination hearings of the JMLP in September 2017, the Planning Inspector raised concerns about the soft sand strategy. The Inspector suggested modifications prior to adoption of the JMLP: to delete references to planning for a declining amount of sand extraction from within the National Park; to replace Policy M2 with new wording, requiring the Authorities to undertake a review to address the shortfall in soft sand to the end of the JMLP plan period (2033); and to remove the proposed allocation for soft sand from Policy M11.

1.6 Preparation of this SSR was to be commenced within six months of adoption of the JMLP and submitted to the Secretary of State within two years from the commencement of the review. An Issues and Options consultation (Regulation 18) was undertaken during January – March 2019. The timetable for the SSR is set out in the statutory management plan, the West Sussex Minerals and Waste Development Scheme.

1.7 Once adopted, the SSR will integrate into the JMLP to provide an up-to-date and robust policy framework for soft sand supply. The SSR covers the following three key matters:

- The identified need for soft sand during the period to 2033;
- The supply strategy, that is, the options that can, either singularly or in combination, be used to meet any identified shortfall; and
- The identification of potential sites and, if required, the selection of one or more of those sites to meet identified need

What is Habitats Regulations Assessment?

1.8 The need for Habitats Regulations Assessment (HRA) is set out within Article 6 of the EC Habitats Directive 1992, and interpreted into British law by the Conservation of Habitats and Species Regulations 2017 (as amended), commonly referred to as the Habitats Regulations. The ultimate aim of HRA is to "maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest" (Habitats Directive, Article

2(2)). This aim relates to habitats and species, not the European sites themselves, although the sites have a significant role in delivering favourable conservation status.

1.9 The Habitats Directive applies the precautionary principle to protected areas (Special Areas of Conservation (SAC), and Special Protection Areas (SPA), collectively known as European sites and which comprise the Natura 2000 pan-European network). The role of these protective nature conservation designations is to provide statutory protection of sites that are of European and global importance as a result of the habitats and species contained within them.

1.10 Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network. As a matter of Government policy, contained within paragraph 5 of ODPM Circular 06/2005, Ramsar sites are treated as a European site, even though they are not such sites as a matter of law.

1.11 In order to ascertain whether or not site integrity will be affected, an HRA should be undertaken of the plan or project in question. Over the years the phrase 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the Habitats Regulations, from screening through to IROPI. This has arisen in order to distinguish the process from the individual stage describes in law as 'appropriate assessment'. Throughout this report, we use the term 'Habitats Regulations Assessment' for the overall process and restrict the use of 'Appropriate Assessment' to the specific stage of that name.

HRA work already undertaken for the SIR

1.12 HRA was undertaken to support the JMLP. This work consisted of the following documents:

- Habitat Regulations Assessment – Screening of LSE Report – March 2010
- Habitat Regulations Assessment – Appropriate Assessment of sites – June 2011
- West Sussex JMLP HRA – December 2016
    - Cover letter following boundary change at Ham Farm (Jan 2017)

1.13 The HRA work undertaken for the JMLP was reviewed ahead of the Issues and Options Consultation of the SSR. The review considered the HRA work to date, relevant to soft sand, including the assessments of soft sand sites, changes in the HRA process, legislation, and other relevant plans and projects. Views were sought from Natural England and the Environment Agency on the review undertaken as to whether the HRA work from the JMLP was fit for purpose for the SSR. Both confirmed that they are content with this previous work being sufficient to support the SSR.

Aims and structure of the report

1.14 This chapter provides an introduction to this HRA report for the SIR Regulation 19. The remainder of this report is structured into the following chapters:

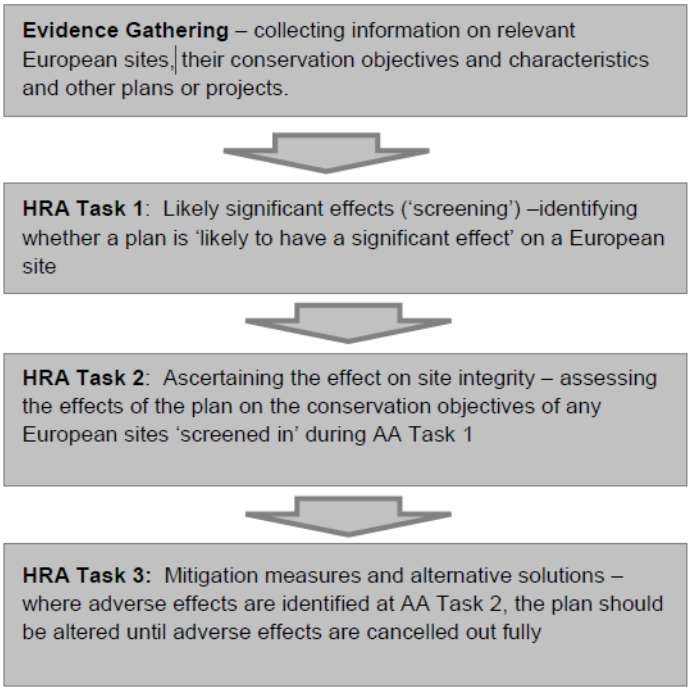
- Chapter 2: Methodology
- Chapter 3: Screening – The 'Likely Significant Effects' Test
- Chapter 4: Appropriate Assessment
- Chapter 5: Conclusions and recommendations
- Appendix A: European sites scoped in for the first stage of screening
- Appendix B: Impact pathway screening of scoped in European sites

- Appendix C: Potential soft sand site maps

2. Methodology

2.1 The process diagram below outlines the stages of HRA according to current draft MHCLG guidance[1]. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

Figure 1 – Four Stage Approach of Habitats Regulations Assessment. Source: CLG, 2006



Screening – Likely Significant Effects Test

2.2 The first stage of any Habitats Regulations Assessment is the screening, also known as the Likely Significant Effect (LSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment (AA) is required. The essential question is: "Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"

2.3 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites.

2.4 The SSR documents have been evaluated in detail within the context of existing knowledge of the various ways in which development can impact on European sites. If it cannot be concluded

[1] CLG (2006) Planning for the Protection of European Sites, Consultation Paper http://webarchive.nationalarchives.gov.uk/20061101113831/http:/www.communities.gov.uk/staging/embedded_object.asp?id=1502353

with confidence that adverse effects are unlikely, we have deferred to the precautionary principle and assumed that they require investigation in the Appropriate Assessment.

2.5 It is necessary to consider these impacts in combination with other plans and projects. For the purposes of this assessment, we have determined that, due to the nature of the identified impacts, the key other plans and projects are the adopted JMLP and those relating to additional housing, commercial/industrial allocations, minerals and waste strategies and major infrastructure projects proposed for West Sussex and surrounding authorities.

2.6 Table 1 below outlines the plans and projects that have been identified as relevant to those pathways for effects upon European sites which have also been identified as relevant to the SSR. These include those which are likely to influence:

- Traffic along roads which pass through or close to European sites which are air-quality sensitive: Ashdown Forest SAC/SPA, Duncton to Bignor Escarpment SAC, The Mens SAC, Ebernoe Common SAC, Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar, Wealden Heaths Phase II SPA, and Woolmer Forest SAC.
- Surface water or groundwater dynamics or water quality within the catchments of: Arun Valley SPA/SAC/Ramsar, Ashdown Forest SAC/SPA, Chichester and Langstone Harbours SPA/Ramsar, Pagham Harbour SPA/Ramsar, Solent Maritime SAC, Woolmer Forest SAC.
- Coastal dynamics at Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar, and Pagham Harbour SPA/Ramsar.
- Landtake/impacts on supporting habitat for birds and bats associated with Chichester and Langstone Harbours SPA/Ramsar, Pagham Harbour SPA/Ramsar, The Arun Valley SPA/Ramsar, The Mens SAC, Ebernoe Common SAC, and Singleton and Cocking Tunnels SAC.
- Disturbance (noise and visual) of bats and birds at the above European sites.

Table 1: Other Plans and Projects with Relevant Potential Impacts

Plan/Project	**Relevance**
The North Solent Shoreline Management (2010)	Development of strategies for coastal management and protection. Potentially relevant in terms of the effects of coastal squeeze on European designated sites.
Chichester Harbour AONB Management Plan 2019-2024 (Third Review)	Sets out the strategy for management of the harbour.
High Weald AONB Management Plan 2019-2024	Sets out objectives related to a number of matters.
Shoreham Harbour Joint Area Action Plan (November 2017).	Sets out detail of spatial strategy in the Shoreham Harbour Area; relevant because it provides detail of development plans.
Adopted Chichester Local Plan: Key Policies 2014-2029	Sets out the spatial strategy for Chichester including housing; relevant because it provides detail of development plans.
Chichester Local Plan Review 2035 *The Preferred Approach Consultation took place between December 2018 and February 2019.*	Will set out the development strategy and policies for the area to meet future needs.
Chichester District Council Site Allocation DPD 2014 – 2029 (2019)	Sets out where development will occur until 2029.

Adopted Arun Local Plan 2011 – 2031 (July 2018)	Sets out the spatial strategy for Arun.
Horsham District Planning Framework (November 2015) *The local plan is currently being reviewed with early consultation (Regulation 18) planned for spring 2020.*	Sets out the spatial strategy including housing for Horsham; relevant because it provides detail of development plans.
Worthing Core Strategy - Adopted 2011	Sets out the spatial strategy for Worthing including housing; relevant because it provides detail of development plans.
Draft Worthing Local Plan (October 2018). Published for consultation between October and December 2018.	Will set the strategy for growth and where development will take place.
The Crawley Borough Local Plan 2015 – 2030 (December 2015) *The Local Plan (Local Plan Review 2020-2035) is currently being reviewed and consultation took place between July and September 2019.*	Sets out the spatial strategy and location of development for Crawley.
Mid Sussex District Plan 2014 – 2031(March 2018)	Sets out the spatial strategy and location of development for Mid Sussex.
Brighton and Hove City Plan: Part 1 (March 2016)	Sets out the spatial strategy for Brighton and Hove including housing; relevant in that it provides detail of development plans
Brighton and Hove Draft City Plan: Part 2 (July 2018) Consultation July to September 2018	Supports the implementation and delivery of City Plan 1 building on the strategic framework and allocating additional development sites.
Wealden District (Incorporating Part of the South Downs National Park) Core Strategy Local Plan (Adopted February 2013)	Sets out the spatial strategy for Wealden including housing; relevant in that it provides detail of development plans affecting Ashdown Forest SAC/SPA
Submission Wealden Local Plan (January, 2019).	Sets out the spatial strategy for Wealden including housing; relevant in that it provides detail of development plans affecting Ashdown Forest SAC/SPA
Havant Borough Council Core Strategy (March, 2011)	Sets out the spatial strategy for Havant.
Havant Borough Local Plan (Allocations) July 2014	Identifies sites for specific uses including housing, employment, retail, recreation and green infrastructure.
Pre-Submission Havant Borough Local Plan 2036 – Public Consultation February to March 2019.	Sets out the spatial strategy for Havant
Adur Local Plan (2017)	Sets the strategic development and land use priorities for Adur.
East Hampshire District Joint Core Strategy (May 2014)	Sets the spatial strategy for development in East Hampshire
East Hampshire District Draft Local Plan 2017 – 2036	Will set the spatial strategy and sites for development in East Hampshire (excluding the parts within the SDNP).
South Downs Local Plan 2014-2033	Sets the strategic development and land use priorities for the South Downs National Park.

South Downs National Park Partnership Management Plan 2014-19	The PMP sets out a vision for the Park to 2050, and policies on the management of pressures within the National Park.
Hampshire Minerals and Waste Plan (October 2013)	Includes minerals and waste policies and locations.
East Sussex, South Downs and Brighton & Hove Waste and Minerals Local Plan (Adopted February 2013)	Includes minerals and waste policies and locations.
East Sussex, South Downs and Brighton and Hove Waste and Minerals Sites Plan (February 2017)	Identifies potential locations for future waste facilities and safeguards existing waste and minerals resources.
Surrey Minerals Core Strategy and Development Plan Document (2011)	Includes minerals policies and locations
Surrey Waste Plan (2008)	Sets out the strategy for waste development.
Submission Surrey Waste Local Plan 2019-2033 (Submitted to the Planning Inspectorate in April 2019).	Will set out how and where different types of waste will be managed in Surrey.
Aviation White Paper (2003) The Government has recently consulted (consultation closed in June 2019) on an Aviation Strategy setting out the challenges and opportunities for aviation to 2050.	Strategic framework for expansion of airport capacity in UK; relevant in that it defines airport growth and requires consideration for localised disturbance issues.
West Sussex Local Transport Plan LTP3 (2011 – 2026)	Sets out road schemes that could potentially affect traffic, and therefore air quality, close to European designated sites Local transport.
Local transport Plans for surrounding authorities	Set out transport schemes that could potentially affect traffic passing into and out of West Sussex, close to European designated sites.
European site Management Plans (where available)	Set out management strategies for designated sites.
Water Resource Management Plans	Define how demand for water resources will be met over the lifetime of the JMLP.
Environment Agency Catchment Abstraction Management Strategies	Provide strategies to ensure water resource availability in West Sussex and surrounding areas.
Environment Agency Catchment Flood Management Plans	Provide strategies to ensure flood risk management within West Sussex.
Environment Agency Stage 3 and 4 Reviews of Consents	Inform licensing strategies to prevent damage to European sites from adverse impacts of water resource depletion or reduction in water quality.
Environment Agency Water Level Management Plans	Provides strategies for water level management at Pulborough Brooks, Waltham Brooks, and Amberley Wild Brooks.
River Arun Tidal Abstraction Scheme (Hardham)	Requires consideration of outcomes for water resources and water quality in relation to Arun Valley SPA/Ramsar.
Tandridge District Core Strategy (2008)	Sets out the vision for the District and a set of key policies.
Tandridge District Council 'Our Local Plan 2033' (Regulation 22) January 2019) *The Regulation 22 Submission stage Local Plan was submitted to the Planning Inspectorate in*	Sets out the development strategy for the district up until 2033.

2019 and the examination hearings are due to take place.	
Waverley Borough Council Local Plan 2002 (April 2002) – saved policies.	Sets out the Council's policies for development in the Borough.
Waverley Local Plan: Part 1 Strategic Policies and Sites (February, 2018)	Sets out the Council's spatial framework for delivering the development and change needed to realise the vision for development in Waverley up to 2032.
Waverley Local Plan: Part 2 Site Allocations and Development Management Policies. *Preferred options consultation May – July 2018. Regulation will take place between October to December 2019.*	Will provide the more detailed 'development management policies, review local designations and allocate sites for housing.
Mole Valley District Council (2000) – saved policies. *The Local Plan is currently being reviewed and will eventually be replaced.*	Sets out the Council's policies for development in the Borough.
Reigate and Banstead Local Plan (2005) – saved policies.	Sets out the Council's policies for development in the Borough.
Reigate and Banstead Core Strategy (July 2014).	Sets out the spatial strategy for development in the borough.
Lewes Core Strategy: Local Plan Part 1 (2016)	Sets out the spatial strategy for development in the District until 2030.
Lewes Local Plan Part 2: Site Allocations and Development Management Policies (December, 2018). *Consultation on the main modifications closed in August 2019.*	Will allocate land for housing, including gypsy and travellers and employment.

Appropriate Assessment

2.7 The term 'appropriate assessment' is not a technical term, as established by case law; it means the suitable further assessment necessary to confirm whether there would be adverse effects on the integrity of the relevant European site, where these cannot be screened out via the Likely Significant Effects test.

2.8 As it is not a technical term, there is not an official methodology, but in practice involves a more detailed analysis with a view of determining if there would be adverse effects on integrity (disruption of the coherent structure and function of the European site). It is also at this stage that mitigation measures can be taken into account in the analysis.

3. Screening (Likely Significant Effects Test)

Introduction

3.1 This section of the report identifies and describes potential impact pathways that may link minerals development in West Sussex with European sites, and identifies whether there could be likely significant effects.

Which European sites are within the scope of this HRA?

3.2 The physical scope of the assessment (i.e. the range of European sites to be considered) is based on a combination of using a scoping 'sphere of influence' zone, tracing impact pathways, and using distances derived from various studies.

3.3 The European sites of relevance to this SSR are shown on Map 1. These sites lie wholly or partly within West Sussex or within the surrounding potential sphere of influence. Full details of the reason for designation, conservation objectives and key vulnerabilities are presented in Appendix A.

3.4 This 'long list' of European sites was then screened to scope out those sites without any potential impact pathways. The zones used for this is 10km, extending to 12km for European sites designated for their bat species, plus further impact pathway specific distances as set out in Table 2 below.

Table 2 – Screening distances used for each source of impact

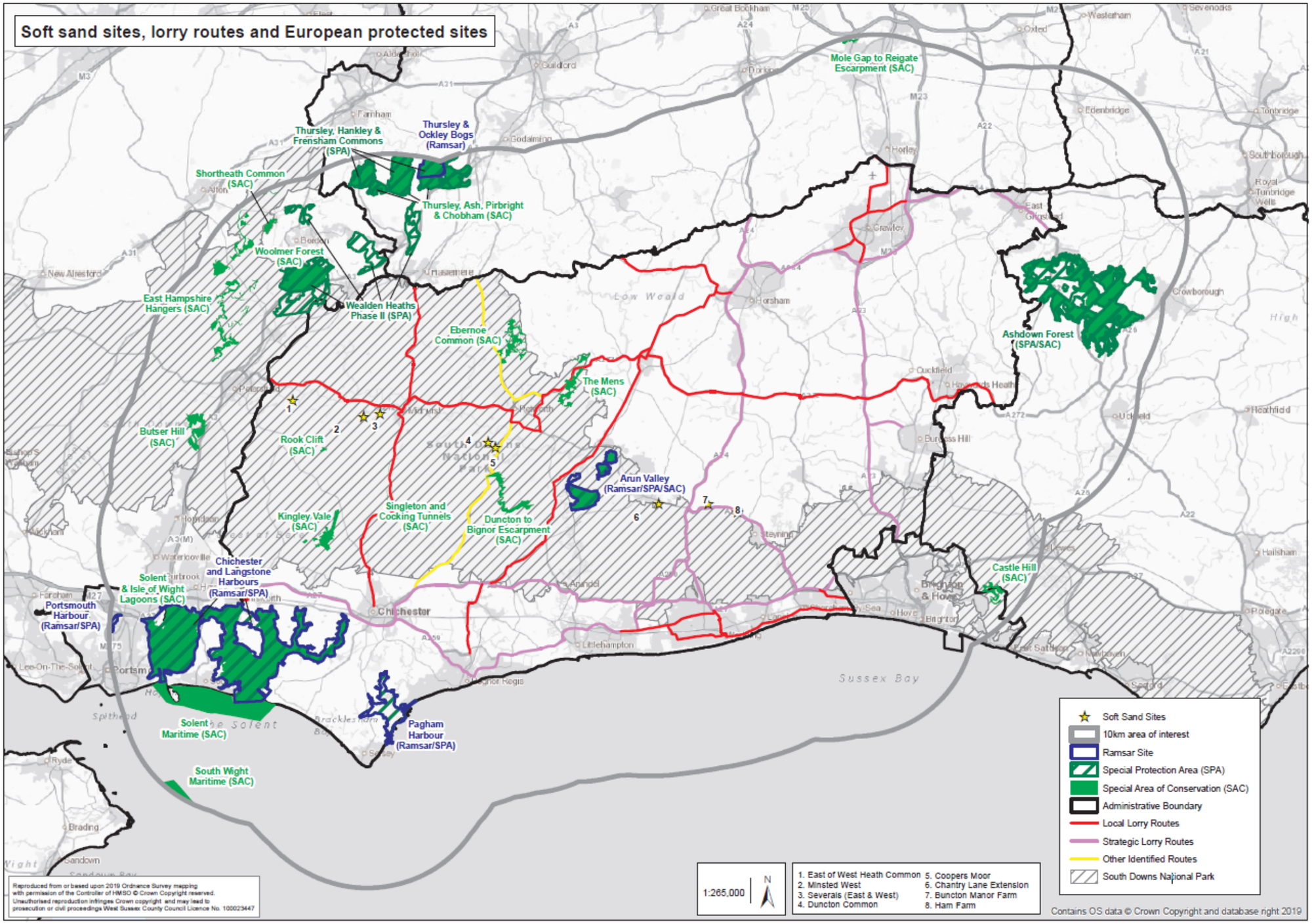
Pathway	Screening distance
Air quality – vehicle exhaust emissions	Traffic arising from development on roads within 200m of air quality sensitive European sites
Air quality – dust	1km from European site
Water quality – suspended solids	No recognised standard distance. Apply Source/Pathway/Receptor approach
Water flows/hydrology	No recognised standard distance. Apply Source/Pathway/Receptor approach
Disturbance (Noise/visual)	1km from European site supporting disturbance sensitive species/populations
Direct landtake of European sites	n/a
Loss of bat habitat	SDNPA and Natural England's final draft landscape scale protocol for the Sussex Bat sites (2018) (The Mens, Singleton and Cocking Tunnels, and Ebernoe Common SACs) uses two screening thresholds of 6.5km and 12km for Key Conservation Areas and Wider Conservation Areas respectively: 6.5km from The Mens, Singleton and Cocking Tunnels, and Ebernoe Common SACs: All potential impacts on barbastelle and Bechstein's bats within this Key Conservation Area to be assessed.

	12km from The Mens, Singleton and Cocking Tunnels, and Ebernoe Common SACs: All potentially significant impacts on barbastelle and Bechstein's bats, including severance to their flightlines, within this Wider Conservation Area to be assessed.

3.5 There are 23 Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites within the potential zone of influence of the SSR area. Of these, 15 have been screened in for further potential mineral sites assessment using the above principles as set out in full in Appendix B:

- Arun Valley SPA/SAC/Ramsar
- Ashdown Forest SAC/SPA
- Butser Hill SAC
- Chichester and Langstone Harbours SPA/Ramsar
- Ebernoe Common SAC
- Duncton to Bignor Escarpment SAC
- Kingley Vale SAC
- Mole Gap to Reigate Escarpment SAC
- Singleton and Cocking Tunnels SAC
- Solent Maritime SAC
- The Mens SAC
- Thursley, Ash, Pirbright and Chobham SAC
- Thursley, Hankley and Frensham Commons SPA (including Thursley and Ockley Bogs Ramsar site)
- Wealden Heaths Phase II SPA
- Woolmer Forest SAC

Map 1: European sites and Lorry Routes network rlevent to the single issue SSR



Potential pathways of impact

Air quality – vehicle exhaust emissions

3.6 Vehicle exhaust emissions only have a local effect within a narrow band along the roadside. The Department for Transport's Transport Analysis Guidance states that '*beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant*'[2]. This is therefore the distance that is used in this HRA report in order to determine whether European sites are likely to be significantly affected by the proposed soft sand sites. The following European sites are air quality sensitive and lie within 200m of a main road that could serve as a transport route for minerals traffic (see Map 1):

- Ashdown Forest SAC/SPA lies within 200m of the A22 and A275 (in East Sussex) for a considerable distance
- Butser Hill SAC lies within 200m of the A3 (in Hampshire) for a considerable distance
- Chichester and Langstone Harbours SPA/Ramsar lies within 200m of the A27
- Duncton to Bignor Escarpment SAC lies within 200m of the A285 for a short distance
- Ebernoe Common SAC lies within 200m of the A283 for a short distance
- Solent Maritime SAC lies within 200m of the A27
- The Mens SAC lies within 200m of the A272 for a considerable distance
- Thursley, Ash, Pirbright and Chobham SAC is bisected by the A3 (in Surrey)
- Thursley, Hankley and Frensham Commons SPA is bisected by the A3 (in Surrey)
- Wealden Heaths Phase II SPA is adjacent to and bisected by the A3 (in Hampshire) for a considerable distance
- Woolmer Forest SAC lies within 200m of the A3 (in Hampshire) for a considerable distance
- Mole Gap to Reigate Escarpment SAC lies within 200m of the M25 and A217 (in Surrey) for a short distance

3.7 Thus, there is potential for impact pathways for vehicle exhaust emissions from quarry traffic to affect air quality sensitive European sites.

3.8 The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH3) and sulphur dioxide (SO2). NOx can have a directly toxic effect upon vegetation. In addition, greater NOx or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

3.9 Sulphur dioxide emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil. Ammonia emissions are dominated by agriculture, with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO2 or NH3 emissions will be associated with mineral extraction activities. NOx emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). Emissions of NOx could therefore be reasonably expected to increase as a result of greater vehicle use as an indirect effect of the mineral extraction activities.

[2] www.webtag.org.uk/archive/feb04/pdf/feb04-333.pdf

3.10 According to the World Health Organisation, the critical NOx concentration (critical threshold) for the protection of vegetation is 30 μgm-3; the threshold for sulphur dioxide is 20 μgm-3. In addition, ecological studies have determined 'critical loads'[3] of atmospheric nitrogen deposition (that is, NOx combined with ammonia NH3) for key habitats within European sites.

3.11 Eutrophication of sensitive habitats through atmospheric deposition is a widely acknowledged phenomenon, although it is extremely difficult to measure as its effects are often hidden by changes in local nutrients (i.e. via direct fertilisation) or changes in grazing pressure.

3.12 In well-managed sites, the effects of eutrophication may be to some extent counteracted through an increase in grazing pressure. Bobbink et al.[4] suggest that sites with low intensity management may have lower critical thresholds than those in higher levels of management. Reintroducing grazing into ungrazed or under-grazed sites can help to counteract changes in vegetation due to nitrogen deposition; however increasing grazing on sites that are already well-grazed may have a direct adverse impact on the plants for which the site was designated.

3.13 Furthermore, air pollution can act synergistically with insufficient grazing to exacerbate management problems and lead to a coarser species-poor sward. A changing climate (i.e. rising temperatures and reduced summer rainfall) is further exacerbating the situation by putting sensitive habitats and species under increasing stress, in turn reducing their competitive ability and increasing susceptibility to pathogens.

3.14 A Transport Assessment for the Soft Sand Review has been undertaken which reviews and updates the work done for the JMLP. This work provides an indication of the proposed distribution of traffic arising from the proposed site; and this can be used to inform understanding of the potential distribution of traffic on roads which are part of the Lorry Routes network within 200m of air quality sensitive European sites.

Air quality – dust

3.15 Sand extraction and associated vehicle movements can result in air pollution from dust particles. Effects of dust will depend on the prevailing wind direction and the transport distance which is related to particle size. Studies have shown that large particles (>30μm) will mostly deposit within 100m of the source, intermediate particles (10-30μm) are likely to travel up to 200-500m and smaller particles (<10μm) can travel up to 1km from the source[5].

3.16 For the purposes of the site specific screening assessment of soft sand sites in the following section, soft sand sites lying more than 1km from a European site have been 'screened out' as being unlikely to cause significant dust impacts even without any mitigation such as wetting. As there are no soft sand sites within 1km of a European site, dust impacts can be ruled out.

Water quality and flows

[3] The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur

[4] Bobbink, Ashmore, Braun, Fluckiger and Vanden Wyngaert. 2002. Work on critical loads for natural and semi-natural systems ("*Empirical nitrogen critical loads for natural and semi-natural ecosystems 2002 update*")

[5] (Scottish Environment Protection Agency. 2003. Technical Guidance Note – Habitat Regulations and The Landfill Regulations Guidance. https://www.sepa.org.uk/media/36946/technical-guidance-note-habitats-regulations-the-landfill-regulations-guidance.pdf

3.17 Sand extraction operations, including de-watering and run-off, have the potential to affect water quality and flows:

- Operations that are below the water table will require dewatering on a regular basis. Dewatering[6] can lead to a reduction in the water table and "draw down" from hydraulically linked groundwater dependent habitats (including streams and rivers);
- The physical presence of a new quarry in the unsaturated zone (i.e. above the water table) can increase the possibility of aquifer contamination and result in a direct reduction in temporary groundwater storage capacity;
- If the water that is pumped from a quarry as a result of dewatering has a high proportion of clays and suspended particles, or is contaminated with metals, it can reduce water quality within those watercourses that receive the water; and
- Backfilling a dormant quarry with overburden or imported fill may cause changes to groundwater levels, quality and flow paths in adjoining areas.

3.18 Of the European sites in West Sussex, or within 10km of the County, nine have particular hydrological sensitivity:

- Arun Valley SAC/SPA/Ramsar
- Chichester and Langstone Harbours SPA/Ramsar
- Pagham Harbour SPA/Ramsar
- Solent Maritime SAC
- South Wight Maritime SAC
- Thursley, Hankley and Frensham Commons SPA
- Thursley and Ockley Bogs Ramsar
- Thursley, Ash, Pirbright and Chobham SAC
- Ashdown Forest SAC/SPA

3.19 With the exception of the Arun Valley SPA/SAC/Ramsar site, none of the above European sites are linked hydrologically to any of the soft sand sites and thus there are no mechanisms for impact pathways.

3.20 Initial screening has identified potential for sediment to enter watercourses which ultimately drain into a European Site (The Arun Valley SPA/SAC/Ramsar site). Thus, there is potential for impact pathways for suspended silt from soft sand sites to affect a water quality sensitive European site.

Noise and visual disturbance

3.21 Sand extraction and associated activities within sites can result in a variety of noise and visual disturbance issues. E.g. Heavy vehicle movements and loud machinery. Birds are the faunal group that is most often considered in relation to disturbance, largely as this is the group on which disturbance impacts have been most studied.

3.22 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding[7]. Disturbance therefore risks increasing energetic output while reducing

[6] Dewatering is most commonly carried out by intermittent pumping from a sump located in the deepest part of the quarry, to keep pace with the inflow of groundwater.

[7] Riddington, R. et al. 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. Bird Study 43:269-279

energetic input, which can adversely affect the 'condition' and ultimately survival of the birds. In addition, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they have to sustain a greater number of birds.[8] Moreover, the more time a breeding bird spends disturbed from its nest, the more its eggs are likely to cool and the more vulnerable they are to predators.

3.23 The most disturbing activities are generally those that involve irregular, infrequent, unpredictable loud noise events, movement or vibration of long duration. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable, quiet patterns of sound or movement or minimal vibration. The further any activity is from the birds, the less likely it is to result in disturbance.

3.24 Other faunal groups, including bats and other mammals, are affected by noise and visual disturbance issues. Bats are particularly sensitive to artificial lighting.

3.25 Of the European sites in West Sussex, or within 10km of the County, eight have been designated at least in part for their bird interest:

- Chichester and Langstone Harbours SPA/Ramsar
- Pagham Harbour SPA/Ramsar
- Arun Valley SAC/SPA/Ramsar
- Ashdown Forest SAC/SPA
- Wealden Heaths Phase II SPA
- Thursley, Hankley and Frensham Commons SPA
- Thursley and Ockley Bogs Ramsar
- Portsmouth Harbour SPA/Ramsar

3.26 The following European sites in West Sussex, or within 10km of the County, were designated at least in part for the presence of maternity or hibernation roosts of bats, which are vulnerable to disturbance:

- Singleton and Cocking Tunnels SAC
- The Mens SAC
- Ebernoe Common SAC
- Mole Gap to Reigate Escarpment SAC

3.27 For the purposes of site specific screening in the following section, soft sand sites lying more than a precautionary distance of 1km from a European site will be 'screened out' as being unlikely to cause noise or visual disturbance to birds, bats or other wildlife.

Direct Landtake of European sites

3.28 There are no European sites within 1km of a soft sand site. Thus, there is no likelihood of direct landtake of a European site. This impact pathway can be screened out.

Bats and habitat loss

[8] Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. RSPB Conservation Review 12: 67-72

3.29 The following European sites have been screened in due to the presence of barbastelle and/or Bechstein's bats, species which are vulnerable to disturbance and are within 12km of potential minerals sites:

- Singleton and Cocking Tunnels SAC (Barbastelle and Bechstein's bats)
- The Mens SAC (Barbastelle bat)
- Ebernoe Common SAC (Barbastelle and Bechstein's bats)

3.30 Radio-tracking and other studies of barbastelle and Bechstein's bats, particularly at Ebernoe Common[9] and The Mens, have identified flightlines and foraging areas used by these species. Flightlines are key commuting routes from roost sites (which may be within a SAC) to foraging or feeding areas (which may be a considerable distance from the SAC). Barbastelle bats can forage 10-15km from the roost sites, often in wet meadows and riparian habitats. Bechstein's bats tend to forage in and around the woodland where they roost with limited outward travel[10].

3.31 Any development that has the potential to impact greenfield sites or existing mature vegetation lines and/or river bank corridors has the potential to impact upon the commuting and foraging routes of bats for which these sites are designated. This could include direct loss of this habitat as well as light and sound/vibration pollution.

3.32 In recognition of the importance of the wider landscape, well outside the SACs, to barbastelle and Bechstein's bats, SDNPA and Natural England have produced a draft landscape scale protocol for the Sussex Bat sites, Ebernoe Common, The Mens, and Singleton and Cocking Tunnels SACs[11]. This is based upon published data[12]. This proposes two screening thresholds of 6.5km and 12km for Key Conservation Areas and Wider Conservation Areas respectively:

- 6.5km from The Mens, Singleton and Cocking Tunnels, and Ebernoe Common SACs: All potential impacts on barbastelle and Bechstein's bats within this Key Conservation Area to be assessed.
- 12km from The Mens, Singleton and Cocking Tunnels, and Ebernoe Common SACs: All potentially significant impacts on barbastelle and Bechstein's bats, including severance to their flightlines, within this Wider Conservation Area to be assessed.

3.33 The above screening thresholds, which have been incorporated into Adopted South Downs Local Plan (Policy SD10), will be used in this HRA. Using these thresholds, there is a potential impact pathway of loss of supporting habitat for roosting, foraging and commuting barbastelle and Bechstein's bats. Further site specific screening is required.

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[9] Greenaway, F. (2004) Advice for the management of flightlines and foraging habitats of the barbastelle bat *Barbastellus barbastellus*. English Nature Research Report, Number 657.
Greenaway, F. (2008) Barbastelle bats in the Sussex West Weald 1997-2008

[10] Schofield H & Morris C. (2000) Ranging behaviour and habitat preferences of female Bechstein's bats in summer.
Fitzsimmons P, Hill D, Greenaway F (2002) Patterns of habitat use by female Bechstein's bats (*Myotis bechsteinii*) from a maternity colony in British woodland.

[11] Natural England and South Downs National Park Authority (2018) Draft Landscape Scale Protocol for the Sussex Bat Sites https://www.southdowns.gov.uk/wp-content/uploads/2018/04/TLL-15-Draft-Sussex-Bat-SAC-Protocol.pdf

[12] Scoping study for the West Sussex Bat Project – Assessing current evidence to recommend conservation measures important to barbastelle and Bechstein's bats of consequence in the project area: a report to Natural England. Bat Conservation Trust 2015
Bat Conservation Trust Core Sustenance Zones
https://cdn.bats.org.uk/pdf/Resources/Core_Sustenance_Zones_Explained_04.02.16.pdf?mtime=20190219173135

Site Specific Screening

3.34 The first initial stage of screening has identified the potential for impact pathways between potential soft sand sites and European sites. Further screening based on the particular sites with potential for soft sand extraction is therefore required to determine whether there may be likely significant effects.

3.35 Table 3 below sets out the screening of each of the eight potential soft sand sites. Where the HRA screening is shaded amber, this means that potential likely significant effects have been identified and appropriate assessment is required.

Table 3: Site specific 'Likely Significant Effects' screening assessment

Potential Soft Sand Site	**Location**	**Screened in European sites** within 10km and Bat SACs within 12km	**HRA Screening (green = screened out, amber = screened in for AA)**
Buncton Manor Farm	Washington (outside SDNP)	• Arun Valley SPA/SAC/Ramsar (7.9km)	Screened in due to **air quality**: The closest European Site is The Arun Valley SPA/SAC/Ramsar site, 7.9km away. Due to the nature of the potential impact pathways to consider (disturbance and water quality) and the distances involved, there is no scope for impact pathways connecting to this European Site. Potential impact pathway identified. There is potential for an increase in traffic arising from this site onto the Lorry Routes network which may pass within 200m of air quality sensitive European sites.
Chantry Lane Extension	Storrington and Sullington (within SDNP)	• Arun Valley SPA/SAC/Ramsar (4.7km) • The Mens SAC (10.6km)	Screened in due to **water quality, bats and air quality:** Potential impact pathways identified. • Potential pathway for sediment to enter the River Stor and ultimately the Arun Valley SPA/SAC/Ramsar site which lies 4.7km away. • Lying 10.6km from The Mens SAC, it falls within the wider 12km bat impact zone. • There is potential for an increase in traffic arising from this site onto the Lorry Routes network which may pass within 200m of air quality sensitive European sites.

Potential Soft Sand Site	**Location**	**Screened in European sites** within 10km and Bat SACs within 12km	**HRA Screening (green = screened out, amber = screened in for AA)**
Coopers Moor Extension	Duncton (within SDNP)	• Duncton to Bignor Escarpment SAC (1.9km) • Arun Valley SPA/SAC/Ramsar (6.4km) • The Mens SAC (6.2km) • Ebernoe Common SAC (6.8km) • Singleton and Cocking Tunnels SAC (8.9km)	Screened in due to **air quality, water quality and bats**: Potential impact pathways identified. • The habitat of Duncton to Bignor Escarpment SAC and Ebernoe Common SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A285 and A283 which lies within 200m of these SAC's respectively, and/or to the wider Lorry Routes network, may result in likely significant effects on air quality sensitive European sites. • Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site. • Lying 6.2km from The Mens SAC, it falls within the 6.5km bat impact zone. Lying 6.8km from Ebernoe Common and 8.9km from Singleton and Cocking Tunnels SACs, it also falls within the wider 12km bat impact zones.
Duncton Common Extension	Duncton (within SDNP)	• Duncton to Bignor Escarpment SAC (2.2km) • Arun Valley SPA/SAC/Ramsar (6.9km) • The Mens SAC (6.2km) • Ebernoe Common SAC (6.2km) • Singleton and Cocking Tunnels SAC (8.1km)	Screened in due to **air quality, water quality and bats**: Potential impact pathways identified. • The habitat of Duncton to Bignor Escarpment SAC and Ebernoe Common SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A285 and A283 which lies within 200m if these SAC's respectively, and/or to the wider Lorry Routes network, may result in likely significant effects on air quality sensitive European sites. • Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site. • Lying 6.2km from The Mens SAC, and 6.2km from Ebernoe Common SAC, it falls just within the 6.5km bat impact zones. Lying 8.1km from Singleton and Cocking Tunnels SACs, it also falls within the wider 12km bat impact zone.

Potential Soft Sand Site	**Location**	**Screened in European sites** within 10km and Bat SACs within 12km	**HRA Screening (green = screened out, amber = screened in for AA)**
East of West Heath Extension	Harting and Rogate (within SDNP)	• Wealden Heaths Phase II SPA (6.8km) • East Hampshire Hangers SAC (6.3km) • Butser Hill SAC (7km) • Kingley Vale SAC (9.6km) • Singleton and Cocking Tunnels SAC (9.3km)	Screened in due to **air quality, water quality, and bats:** Potential impact pathways identified. • Potential traffic emissions to a number of air quality sensitive European sites (Wealden Heaths Phase II SPA, Woolmer Forest SAC, Butser Hill SAC, East Hampshire Hangers SAC, Thursley, Ash, Pirbright & Chobham SAC, Thursley, Hankley & Frensham Commons SPA) should quarry traffic use the A3 via the A272 and/or to other routes on the wider Lorry Routes network which passes within 200m of identified air quality sensitive European sites. • Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site. • Lying 9.3km from Singleton and Cocking Tunnels SAC, it falls within the wider 12km bat impact zone.
Ham Farm	Steyning and Wiston (outside SDNP)	There are no European Sites within 10km of this site and no bat SACs within 12km.	Screened in due to **air quality:** Potential impact pathway identified. Whilst there are no European Sites within 10km of this site and no bat SACs within 12km, there is potential for an increase in traffic arising from this site onto the Lorry Routes network which may pass within 200m of air quality sensitive European sites.
Minsted West Extension	Stedham with Iping (within SDNP)	• Singleton and Cocking Tunnels SAC (4.3km) • Kingley Vale SAC (7.8km). • Wealden Heaths Phase II SPA (9.6km) • Ebernoe Common SAC (11.8km)	Screened in due to **water quality,bats and air quality:** Potential impact pathways identified. • Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site. • Lying 4.3km from Singleton and Cocking Tunnels SAC, it falls within the 6.5km bat impact zone. Lying 11.8km from Ebernoe Common SAC, it also falls within the wider 12km bat impact zone. • Potential traffic emissions to a number of air quality sensitive European sites (Wealden Heaths Phase II SPA, Woolmer Forest SAC, Butser Hill SAC, East Hampshire Hangers SAC, Thursley, Ash, Pirbright & Chobham SAC,

Potential Soft Sand Site	**Location**	**Screened in European sites** within 10km and Bat SACs within 12km	**HRA Screening (green = screened out, amber = screened in for AA)**
			Thursley, Hankley & Frensham Commons SPA) should quarry traffic use the A3 via the A272 and/or to other routes on the wider Lorry Routes network which passes within 200m of identified air quality sensitive European sites.
Severals East and West	Woolbeding with Redford (within SDNP)	• Singleton and Cocking Tunnels SAC (3.7km) • Kingley Vale SAC (8.3km) • Duncton to Bignor Escarpment SAC (9.7km) • Ebernoe Common SAC (10.0km)	Screened in due to **water quality, bats and air quality:** Potential impact pathways identified: • Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site. • Lying 3.7km from Singleton and Cocking Tunnels SAC, it falls within the 6.5km bat impact zone. Lying 10.0km from Ebernoe Common SAC, it also falls within the wider 12km bat impact zone. • Potential traffic emissions to a number of air quality sensitive European sites (Wealden Heaths Phase II SPA, Woolmer Forest SAC, Butser Hill SAC, East Hampshire Hangers SAC, Thursley, Ash, Pirbright & Chobham SAC, Thursley, Hankley & Frensham Commons SPA) should quarry traffic use the A3 via the A272 and/or to other routes on the wider Lorry Routes network which passes within 200m of identified air quality sensitive European sites.

Screening conclusions

3.36 The site specific screening undertaken has screened in all potential soft sand sites for potential likely significant effects and therefore appropriate assessment is required. This initial screening has identified the following impact pathways which are explored further through the appropriate assessment section of this report:

- Water Quality: The following six sites have been screened in due to the potential for site working to result in run-off containing suspended silt and their proximity to watercourses which ultimately drain into the Arun Valley SPA/SAC/Ramsar site:
    - Chantry Lane Extension
    - Coopers Moor Extension
    - Duncton Common Extension
    - East of West Heath Extension
    - Minsted West Extension
    - Severals East and West

- Air Quality: Initial screening has identified the potential for vehicle exhaust emissions from quarry traffic to affect some air quality sensitive European sites should the vehicles use particular routes of the Lorry Routes network which pass within 200m of these air quality sensitive sites, such as the A3. All sites have been screened in on the basis that at this stage each site may, in principle, result in increased traffic movements on affected roads.

- Bats: The following six sites have been screened in as each of these sites are within either 6.5km zone or 12km zone of the three SACs in West Sussex designated for their populations of barbastelle and Bechstein's bats. These zones are established through the Sussex Bat SAC Planning and Landscape Scale Enhancement Protocol. There is potential for likely significant effects resulting from loss of supporting habitat and disturbance of roosting, foraging and commuting barbastelle and Bechstein's bats:
    - Chantry Lane Extension
    - Coopers Moor Extension
    - Duncton Common Extension
    - East of West Heath Extension
    - Minsted West Extension
    - Severals East and West.

4. Appropriate Assessment

4.1 This chapter considers each soft sand site that was identified as requiring Appropriate Assessment following initial screening.

Table 4: Appropriate Assessment Summary Table

Potential Soft Sand Site	Reason why screened in for AA	Brief summary of why screened in for AA	Avoidance/mitigation measures approach, if required
Buncton Manor Farm	Air Quality	Potential for an increase in traffic arising from this site onto the Lorry Routes network which may pass within 200m of air quality sensitive European sites.	Transport assessments and, where necessary, air quality impact assessment, as part of a **project-level Appropriate Assessment.**
Chantry Lane Extension	Water Quality	Potential pathway for sediment to enter the River Stor and ultimately the Arun Valley SPA/SAC/Ramsar site which lies some 4.7km away.	Sediment loading to be controlled by **conditions**
	Bats	Within the 12km zone for The Mens SAC.	Addressed via **project-level Appropriate Assessment.**
	Air Quality	Potential for an increase in traffic arising from this site onto the Lorry Routes network which may pass within 200m of air quality sensitive European sites.	Transport assessments and, where necessary, air quality impact assessment, as part of a **project-level Appropriate Assessment.**
Coopers Moor Extension	Air Quality	Potential for an increase in traffic arising from this site onto the Lorry Routes network which pass within 200m of air-quality sensitive sites – notably the Duncton to Bignor Escarpment SAC and Ebernoe Common SAC.	Transport assessments and, where necessary, air quality impact assessment, as part of a **project-level Appropriate Assessment.**
	Water Quality	Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site	Sediment loading to be controlled by **conditions**
	Bats	Within the 6.5km zone for The Mens SAC and the 12km zone for Ebernoe Common SAC, and Singleton and Cocking Tunnels SAC.	Addressed via p**roject-level Appropriate Assessment.**
Duncton Common Extension	Air Quality	Potential for an increase in traffic arising from this site onto the Lorry Routes network which pass within 200m of air-quality sensitive sites – notably the Duncton to Bignor Escarpment SAC and Ebernoe Common SAC.	Transport assessments and, where necessary, air quality impact assessment, as part of a **project-level Appropriate Assessment.**
	Water Quality	Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site	Sediment loading to be controlled by **conditions**

	Bats	Within the 6.5km zone for The Mens SAC and Ebernoe Common SAC. Within the 12km zone for Singleton and Cocking Tunnels SAC.	Addressed via **project-level Appropriate Assessment**.
East of West Heath Extension	Air Quality	Potential for an increase in traffic arising from this site onto the Lorry Routes network which may pass within 200m of air quality sensitive European sites – notably the European sites on the A3 corridor.	Transport assessments and, where necessary, air quality impact assessment, as part of a **project-level Appropriate Assessment.**
	Water Quality	Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site.	Sediment loading to be controlled by **conditions**
	Bats	Within the 12km zone for the Singleton and Cocking Tunnels SAC.	Addressed via **project-level Appropriate Assessment.**
Ham Farm	Air Quality	Potential for an increase in traffic arising from this site onto the Lorry Routes network which may pass within 200m of air quality sensitive European sites.	Transport assessments and, where necessary, air quality impact assessment, as part of a **project-level Appropriate Assessment.**
Minsted West Extension	Water Quality	Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site.	Sediment loading to be controlled by **conditions**
	Bats	Within the 6.5km zone for Singleton and Cocking Tunnels SAC and the 12km zone for Ebernoe Common SAC.	Addressed via **project-level Appropriate Assessment.**
	Air Quality	Potential for an increase in traffic arising from this site onto the Lorry Routes network which may pass within 200m of air quality sensitive European sites- notably the European sites on the A3 corridor.	Transport assessments and, where necessary, air quality impact assessment, as part of a **project-level Appropriate Assessment.**
Severals East and West	Water Quality	Potential pathway for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site.	Sediment loading to be controlled by **conditions**
	Bats	Within the 6.5km zone for Singleton and Cocking Tunnels SAC and the 12km zone for Ebernoe Common SAC.	Addressed via **project-level Appropriate Assessment.**
	Air Quality	Potential for an increase in traffic arising from this site onto the Lorry Routes network which may pass within 200m of air quality sensitive European sites – notably the European sites on the A3 corridor.	Transport assessments and, where necessary, air quality impact assessment, as part of a **project-level Appropriate Assessment.**

Buncton Manor Farm

Air Quality

4.2 This site, as a new site for soft sand working, has the potential to increase traffic movements on the Lorry Route network, some of which passes within 200m of European sites identified in this report which are air quality sensitive. The purpose of the SSR is to plan for a steady and adequate supply of minerals for the whole plan period. The timing that new sites come forward is therefore critical to understand whether there is a net increase in traffic movements on the Lorry Route network.

4.3 If this site were to be allocated in the SSR, at the time planning permission is sought, it will be necessary to undertake transport assessment to determine whether there is an increase in traffic movements, and where necessary associated air quality work. This information would inform a project-level HRA to ensure that there are to be no adverse effects on the integrity of the identified air-quality sensitive European sites.

Chantry Lane Extension

Water quality

4.4 A watercourse adjacent to this site drains into the River Stor which flows into the Arun Valley SPA/SAC/Ramsar site, some 4.7km away. Thus, a potential pathway has been identified for sediment to enter the River Stor and ultimately the Arun Valley SPA/SAC/Ramsar site. However, en route the river passes the settlement of Storrington and two water treatment works. Input of water from the River Stor into the Arun Valley SPA/SAC/Ramsar site is only permitted through opening of sluice gates as an 'emergency measure' in very dry conditions as the water quality within the River Stor is already poor. It is therefore clear that flows from the River Stor are not essential for the continued maintenance of the integrity of the SPA/SAC/Ramsar site.

4.5 Furthermore, as it is an offence to pollute watercourses irrespective of whether they drain into a European Site, it can be assumed that any risk of sediment loading will be controlled through conditions.

4.6 It can therefore be concluded that Chantry Lane Extension will not have an adverse effect on the Arun Valley SPA/SAC/Ramsar site through reduced water quality.

Air Quality

4.7 This site has the potential to increase traffic movements on the Lorry Route network, some of which passes within 200m of European sites identified in this report which are air quality sensitive. The purpose of the SSR is to plan for a steady and adequate supply of minerals for the whole plan period. The timing that new sites come forward is therefore important to understand whether there is a net increase in traffic movements on the Lorry Route network. As this site is an extension site to existing works, it is understood that this site would come forward following the current site, in succession, and would therefore be 'neutral' as regards generation of traffic movements. Therefore there would not be an adverse effect on the integrity of the air-quality sensitive European sites as identified in this report.

4.8 If this site were to be allocated in the SSR, at the time planning permission is sought, it will be necessary to undertake transport assessment to determine whether there is an increase in traffic movements, and where necessary associated air quality work. This information would inform a project-level HRA to ensure that there are to be no adverse effects on the integrity of the identified air-quality sensitive European sites.

Bats

4.9 This site is within the 12km zone for The Mens SAC. Potential impacts on barbastelle and Bechstein's bat populations associated with The Mens SAC will need to be addressed through habitat and protected species survey and any required avoidance and mitigation measures to inform a project-level Appropriate Assessment.

Coopers Moor Extension

Water quality

4.10 A watercourse adjacent to this site drains into the River Rother which flows into the Arun Valley SPA/SAC/Ramsar site, some 6.4km away. Thus, a potential pathway has been identified for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site.

4.11 Given the large distances involved, any increase in sediment that might arise from run-off and/or dewatering of this sand site would be subject to such a scale of dilution that its effect would be negligible. Furthermore, as it is an offence to pollute watercourses irrespective of whether they drain into a European Site, it can be assumed that any risk of sediment loading will be controlled through conditions.

4.12 It can therefore be concluded that Coopers Moor Extension will not have an adverse effect on the Arun Valley SPA/SAC/Ramsar site through reduced water quality.

Bats

4.13 This site is within the 6.5km zone for The Mens SAC and the 12km zone for Ebernoe Common SAC and Singleton and Cocking Tunnels SAC. The site contains woodland habitat and is in close proximity to the River Rother; potential supporting habitat features to the SACs for foraging, roosting and commuting. Potential impacts on barbastelle and Bechstein's bat populations associated with The Mens SAC, Ebernoe Common SAC and Singleton and Cocking Tunnels SAC will need to be addressed through habitat and protected species survey and any required avoidance and mitigation measures to inform a project-level Appropriate Assessment.

Air quality

4.14 This site has the potential to increase traffic movements on the Lorry Route network, some of which passes within 200m of European sites identified in this report which are air quality sensitive. The Transport Assessment for the SSR notes the A285 and A283 within the Lorry Routes network as the initial stages of the proposed distribution of traffic movements, The A285 passes within 200m of the Duncton to Bignor Escarpment SAC and the A283 passes within 200m of Ebernoe Common SAC; both of which are air-quality sensitive. The purpose of the

SSR is to plan for a steady and adequate supply of minerals for the whole plan period. The timing that new sites come forward is therefore important to understand whether there is a net increase in traffic movements on the Lorry Route network. As this site is an extension site to existing works, it is understood that this site would come forward following the current site, in succession, and would therefore be 'neutral' as regards generation of traffic movements. Therefore there would not be an adverse effect on the integrity of the air-quality sensitive European sites as identified in this report.

4.15 If this site were to be allocated in the SSR, at the time planning permission is sought, it will be necessary to undertake transport assessment to determine whether there is an increase in traffic movements, and where necessary associated air quality work. This information would inform a project-level HRA to ensure that there are to be no adverse effects on the integrity on the identified air-quality sensitive European sites.

Duncton Common Extension

Air quality

4.16 This site has the potential to increase traffic movements on the Lorry Route network, some of which passes within 200m of European sites identified in this report which are air quality sensitive. The Transport Assessment for the SSR notes the A285 and A283 within the Lorry Routes network as the initial stages of the proposed distribution of traffic movements, The A285 passes within 200m of the Duncton to Bignor Escarpment SAC and the A283 passes within 200m of Ebernoe Common SAC; both of which are air-quality sensitive. The purpose of the SSR is to plan for a steady and adequate supply of minerals for the whole plan period. The timing that new sites come forward is therefore important to understand whether there is a net increase in traffic movements on the Lorry Route network. As this site is an extension site to existing works, it is understood that this site would come forward following the current site, in succession, and would therefore be 'neutral' as regards generation of traffic movements. Therefore there would not be an adverse effect on the integrity of the air-quality sensitive European sites as identified in this report.

4.17 If this site were to be allocated in the SSR, at the time planning permission is sought, it will be necessary to undertake transport assessment to determine whether there is an increase in traffic movements, and where necessary associated air quality work. This information would inform a project-level HRA to ensure that there are to be no adverse effects on the integrity on the identified air-quality sensitive European sites.

Water quality

4.18 A watercourse adjacent to this site drains into the River Rother which flows into the Arun Valley SPA/SAC/Ramsar site, some 6.9km away. Thus, a potential pathway has been identified for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site.

4.19 Given the large distances involved, any increase in sediment that might arise from run-off and/or dewatering of this sand site would be subject to such a scale of dilution that its effect would be negligible. Furthermore, as it is an offence to pollute watercourses irrespective of whether they drain into a European Site, it can be assumed that any risk of sediment loading will be controlled through conditions.

4.20 It can therefore be concluded that Duncton Common Extension will not have an adverse effect on the Arun Valley SPA/SAC/Ramsar site through reduced water quality.

Bats

4.21 The site is within the 6.5km zone for The Mens SAC and Ebernoe Common SAC, and within the 12km zone for Singleton and Cocking Tunnels SAC. The site contains woodland habitat and is in close proximity to the River Rother; potential supporting habitat features to the SACs for foraging, roosting and commuting. Potential impacts on barbastelle and Bechstein's bat populations associated with The Mens SAC, Ebernoe Common SAC and Singleton and Cocking Tunnels SAC will need to be addressed through habitat and protected species survey and any required avoidance and mitigation measures to inform a project-level Appropriate Assessment.

East of West Heath Extension

Air quality

4.22 This site has the potential to increase traffic movements on the Lorry Route network, some of which passes within 200m of European sites identified in this report which are air quality sensitive. The Transport Assessment for the SSR notes that traffic is expected to travel to the A3 via the A272. The following sites are air-quality sensitive European sites within 200m identified in the screening section of this report: Wealden Heaths Phase II SPA, Woolmer Forest SAC, Butser Hill SAC, East Hampshire Hangers SAC, Thursley, Ash, Pirbright & Chobham SAC, Thursley, Hankley & Frensham Commons SPA.

4.23 The purpose of the SSR is to plan for a steady and adequate supply of minerals for the whole plan period. The timing that new sites come forward is therefore important to understand whether there is a net increase in traffic movements on the Lorry Route network. As this site is an extension site to existing works, it is understood that this site would come forward following the current site, in succession, and would therefore be 'neutral' as regards generation of traffic movements. Therefore there would not be an adverse effect on the integrity of the air-quality sensitive European sites as identified in this report.

4.24 If this site were to be allocated in the SSR, at the time planning permission is sought, it will be necessary to undertake transport assessment to determine whether there is an increase in traffic movements, and where necessary associated air quality work. This information would inform a project-level HRA to ensure that there are to be no adverse effects on the integrity on the identified air-quality sensitive European sites.

Water quality

4.25 A watercourse adjacent to this site drains into the River Rother which flows into the Arun Valley SPA/SAC/Ramsar site, over 12km away. Thus, a potential pathway has been identified for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site.

4.26 Given the large distances involved, any increase in sediment that might arise from run-off and/or dewatering of this sand site would be subject to such a scale of dilution that its effect would be negligible. Furthermore, as it is an offence to pollute watercourses irrespective of whether they

drain into a European Site, it can be assumed that any risk of sediment loading will be controlled through conditions.

4.27 It can therefore be concluded that East of West Heath will not have an adverse effect on the Arun Valley SPA/SAC/Ramsar site through reduced water quality.

Bats

4.28 The site is within the 12km zone for the Singleton and Cocking Tunnels SAC. The site is adjacent to areas of woodland and contains trees and rows of trees on site which may be potential features, including for commuting bats, Potential impacts on barbastelle and Bechstein's bat populations associated with Singleton and Cocking Tunnels SAC will need to be addressed through habitat and protected species survey and any required avoidance and mitigation measures to inform a project-level Appropriate Assessment.

Ham Farm

Air Quality

4.29 This site, as new site for soft sand working, has the potential to increase traffic movements on the Lorry Route network, some of which passes within 200m of European sites identified in this report which are air quality sensitive. The purpose of the SSR is to plan for a steady and adequate supply of minerals for the whole plan period. The timing that new sites come forward is therefore critical to understand whether there is a net increase in traffic movements on the Lorry Route network.

4.30 If this site were to be allocated in the SSR, at the time planning permission is sought, it will be necessary to undertake transport assessment to determine whether there is an increase in traffic movements, and where necessary associated air quality work. This information would inform a project-level HRA to ensure that there are to be no adverse effects on the integrity on the identified air-quality sensitive European sites.

Minsted West Extension

Water quality

4.31 A watercourse adjacent to this site drains into the River Rother which flows into the Arun Valley SPA/SAC/Ramsar site, over 12km away. Thus, a potential pathway has been identified for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site.

4.32 Given the large distances involved, any increase in sediment that might arise from run-off and/or dewatering of this sand site would be subject to such a scale of dilution that its effect would be negligible. Furthermore, as it is an offence to pollute watercourses irrespective of whether they drain into a European Site, it can be assumed that any risk of sediment loading will be controlled through conditions.

4.33 It can therefore be concluded that Minsted West Extension will not have an adverse effect on the Arun Valley SPA/SAC/Ramsar site through reduced water quality.

Bats

4.34 This site is within the 6.5km zone for Singleton and Cocking Tunnels SAC and the 12km zone for Ebernoe Common SAC. The site is adjacent to areas of woodland which may be suitable supporting habitat for the SACs. Potential impacts on barbastelle and Bechstein's bat populations associated with Singleton and Cocking Tunnels SAC, and Ebernoe Common SAC will need to be addressed through.

Air quality

4.35 This site has the potential to increase traffic movements on the Lorry Route network, some of which passes within 200m of European sites identified in this report which are air quality sensitive. The Transport Assessment for the SSR notes that traffic is expected to travel to the A3 via the A272. The following sites are air-quality sensitive European sites within 200m identified in the screening section of this report: Wealden Heaths Phase II SPA, Woolmer Forest SAC, Butser Hill SAC, East Hampshire Hangers SAC, Thursley, Ash, Pirbright & Chobham SAC, Thursley, Hankley & Frensham Commons SPA.

4.36 The purpose of the SSR is to plan for a steady and adequate supply of minerals for the whole plan period. The timing that new sites come forward is therefore important to understand whether there is a net increase in traffic movements on the Lorry Route network. As this site is an extension site to existing works, it is understood that this site would come forward following the current site, in succession, and would therefore be 'neutral' as regards generation of traffic movements. Therefore there would not be an adverse effect on the integrity of the air-quality sensitive European sites as identified in this report.

4.37 If this site were to be allocated in the SSR, at the time planning permission is sought, it will be necessary to undertake transport assessment to determine whether there is an increase in traffic movements, and where necessary associated air quality work. This information would inform a project-level HRA to ensure that there are to be no adverse effects on the integrity on the identified air-quality sensitive European sites.

Severals East and West

Water quality

4.38 A watercourse adjacent to this site drains into the River Rother which flows into the Arun Valley SPA/SAC/Ramsar site, over 12km away. Thus, a potential pathway has been identified for sediment to enter the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site.

4.39 Given the large distances involved, any increase in sediment that might arise from run-off and/or dewatering of this sand site would be subject to such a scale of dilution that its effect would be negligible. Furthermore, as it is an offence to pollute watercourses irrespective of whether they drain into a European Site, it can be assumed that any risk of sediment loading will be controlled through conditions.

4.40 It can therefore be concluded that Severals East and West will not have an adverse effect on the Arun Valley SPA/SAC/Ramsar site through reduced water quality.

Bats

4.41 This site is within the 6.5km zone for Singleton and Cocking Tunnels SAC and the 12km zone for Ebernoe Common SAC. The site is adjacent to areas of woodland which may be suitable supporting habitat for the SACs. Potential impacts on barbastelle and Bechstein's bat populations associated with Singleton and Cocking Tunnels SAC, and Ebernoe Common SAC will need to be addressed through habitat and protected species survey and any required avoidance and mitigation measures to inform a project-level Appropriate Assessment.

Air quality

4.42 This site, as a new site for soft sand working, has the potential to increase traffic movements on the Lorry Route network, some of which passes within 200m of European sites identified in this report which are air quality sensitive. The Transport Assessment for the SSR notes that traffic is expected to travel to the A3 via the A272. The following sites are air-quality sensitive European sites within 200m identified in the screening section of this report: Wealden Heaths Phase II SPA, Woolmer Forest SAC, Butser Hill SAC, East Hampshire Hangers SAC, Thursley, Ash, Pirbright & Chobham SAC, Thursley, Hankley & Frensham Commons SPA. The purpose of the SSR is to plan for a steady and adequate supply of minerals for the whole plan period. The timing that new sites come forward is therefore critical to understand whether there is a net increase in traffic movements on the Lorry Route network.

4.43 If this site were to be allocated in the SSR, at the time planning permission is sought, it will be necessary to undertake transport assessment to determine whether there is an increase in traffic movements, and where necessary associated air quality work. This information would inform a project-level HRA to ensure that there are to be no adverse effects on the integrity on the identified air-quality sensitive European sites.

Proposed allocations and consideration of in combination effects

4.44 Previously in this HRA report, each of the potential soft sand sites have been considered. Not all of these sites are now proposed for allocation as part of the SSR; and it is appropriate to now consider these proposed sites in assessing potential for in combination effects. The Proposed Submission Draft SSR allocates the following sites:

- Ham Farm
- East of West Heath Extension
- Chantry Lane Extension

4.45 The East of West Heath and Chantry Lane Extensions proposed allocations are capable of coming forward without in combination effects on water quality due to the protections provided by conditions controlling sediment load. These proposed allocations are also capable of coming forward without in combination effects on bats, both via disturbance and loss of supporting habitat, subject to detailed assessment at planning application stage via a project-level appropriate assessment to show that any loss or other impact on foraging, commuting or hibernating habitat is avoided or afforded appropriate mitigation.

4.46 The three proposed allocations have the potential for alone and in combination effects with other plans and projects with regard to air quality impacts on air-quality sensitive European sites as identified in this report, however this is primarily a matter as to the timing in which these

sites come forward. The SSR is planning for a steady and adequate supply of minerals for the whole plan period and as such it is generally expected that new sites would come online as existing sites come to the end of their working – this is especially noted for extension sites. At plan preparation stage it is not possible to be certain when these sites will precisely come forward, therefore it is necessary to take a precautionary approach and require that transport assessment and any associated air quality work be undertaken at planning application stage to inform a project-level HRA.

5. Conclusions and recommendations

5.1 The three proposed allocation sites for soft sand working are, based on information available at this plan preparation stage, expected to be capable of coming forward without adverse effect on the integrity of European sites as identified in this HRA report, alone or in combination with other plans and projects, subject to the following measures at planning applications stage:

- Conditions applied to control sediment loading for East of West Heath Extension and Chantry Lane Extension.
- Project-level Appropriate Assessment to address impacts on bats, for East of West Heath Extension and Chantry Lane Extension, and air quality for all three proposed allocations. It is recommended that the following be added to the development principles for the three proposed allocation sites in the supporting text which accompanies Policy M11:
  '*A project-level Appropriate Assessment is required to assess the potential impacts and demonstrate how this site will be delivered without adverse effect on the integrity of any Natura 2000 sites'*.

Appendix A

European Designated Sites Scoped in for the first stage of screening (i.e. within 10km of West Sussex County)

All data sourced from the JNCC reference date 26/03/2019, all areas rounded to the nearest whole hectare. Data accessed 10/09/2019.

https://hub.jncc.gov.uk/assets/a3d9da1e-dedc-4539-a574-84287636c898

https://designatedsites.naturalengland.org.uk/SiteSearch.aspx

Site	Area (ha)	Summary of Qualifying Features	Summary of Conservation Objectives	Summary of Key Environmental Conditions to Support Site Integrity
Arun Valley SAC/SPA/ Ramsar	SPA: 530 SAC: 487	– Ramshorn snail – The area is of outstanding ornithological importance assemblage of waterbirds and notably for wintering wildfowl and breeding waders, including Bewick's swan and northern pintail. – The site holds seven wetland invertebrate species listed in the British Red Data Book as threatened. One of these, Pseudamnicola confusa, is considered to be endangered. The site also supports four nationally rare and four nationally scarce plant species. – The ditches intersecting the site have a particularly diverse and rich flora. All five British duckweed Lemna species, all five water-cress Rorippa species, and all three British water milfoils (Myriophyllum species), all but one of the seven British water	Maintain or restore: – The extent and distribution of the habitats of the qualifying features – The structure and function of the habitats of the qualifying features – The supporting processes on which the habitats of the qualifying features rely – The population of each of the qualifying features, and, – The distribution of the qualifying features within the site.	– Appropriate ditch management – Control of shade-inducing marginal vegetation is Maintaining access to the water's edge for livestock. Ensure good water – Appropriate grazing management – Sympathetic management of lowland wet grassland/grazing marsh (including water level management). – Minimal disturbance – Management of the hydrology of the area important. For example, the impact – of water abstraction, river maintenance, and ensuring that winter flooding can continue as part of the existing management of the site.

		dropworts (Oenanthe species), and two-thirds of the British pondweeds (Potamogeton species) can be found on site.		
Ashdown Forest SAC/SPA	SPA: 3207 SAC: 2716	− Wet heathland with cross-leaved heath − Dry heaths − Great crested newts − Nationally important breeding populations of nightjar and Dartford warbler	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats and habitats of qualifying species − The structure and function (including typical species) of qualifying natural habitats − The structure and function of the habitats of qualifying species − The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely − The populations of qualifying species, and, − The distribution of qualifying species within the site.	− Minimal air pollution (nitrogen deposition can cause compositional changes over time) − Use of grazing management to prevent succession − Balanced hydrological regime to maintain wet heath. − Minimal recreational disturbance − Absence of fertilisation − Suitable foraging and refuge habitat within 500m of the pond. − Relatively unpolluted water of roughly neutral pH. − Some ponds deep enough to retain water throughout February to August at least one year in every three. − In a wider context, great crested newts require good connectivity of landscape features (ponds, hedges etc.) as they often live as metapopulations in a number of ponds.
Butser Hill SAC	237	− Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites) − Yew-dominated woodland	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats − The structure and function (including typical species) of qualifying natural habitats, and − The supporting processes on which qualifying natural habitats rely.	− Vulnerable to spray-drift (i.e. eutrophication) from surrounding intensively managed arable land
Castle Hill SAC	115	− Semi-natural dry grasslands and scrubland facies on calcareous	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site	− Grazing levels to conserve and enhance plant (and associated animal) species

		substrates (Festuco-Brometalia) (*important orchid sites) − Early gentian	contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats and habitats of qualifying species − The structure and function (including typical species) of qualifying natural habitats − The structure and function of the habitats of qualifying species − The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely − The populations of qualifying species, and, − The distribution of qualifying species within the site.	− Management of scrub encroachment − Leaching and spray-drift of nutrients from surrounding arable land.
Chichester and Langstone Harbours SPA/Ramsar	5811	− Internationally important wintering populations of Brent goose, pintail, shoveler, teal ruddy turnstone, sanderling, dunlin, ringed plover, bartailed godwit, black-tailed godwit, redbreasted merganser, curlew, grey plover, shelduck, common redshank. − Internationally important breeding population of little tern, common tern and sandwich tern. − Over winter the area regularly supports 76480 waterfowl (5 year peak mean 1998/99-2002/2003) − Internationally important population of wintering waterfowl (Ramsar) including Dark-bellied brent, shelduck, grey plover and dunlin − Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats,	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; − The extent and distribution of the habitats of the qualifying features − The structure and function of the habitats of the qualifying features − The supporting processes on which the habitats of the qualifying features rely − The population of each of the qualifying features, and, − The distribution of the qualifying features within the site.	− Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze. − Unpolluted water. − Absence of nutrient enrichment of water. − Minimal recreational and other disturbance − Absence of non-native species e.g. from shipping activity. − Maintenance of appropriate hydrological regime, e.g. freshwater flows at heads of channels are important for birds to preen, drink and feed. − Short grasslands surrounding the site are essential to maintaining interest features as they are now the key foraging resource for Brent goose.

		saltmarsh, sand and shingle spits and sand dunes.		
East Hampshire Hangers SAC	562	− Mixed woodland (ash Fraxinus excelsior, wych elm Ulmus glabra and lime (mainly small-leaved lime Tilia cordata but more rarely large-leaved lime T. platyphyllos)) on base-rich soils associated with rocky slopes − Asperulo-Fagetum beech forests − Semi-natural dry grasslands and scrublands on chalk or limestone, including important orchid sites − Yew-dominated woodland − Early gentian	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats and habitats of qualifying species − The structure and function (including typical species) of qualifying natural habitats − The structure and function of the habitats of qualifying species − The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely − The populations of qualifying species, and, − The distribution of qualifying species within the site.	− Low nutrient runoff from surrounding land − Being steep and narrow, the Hanger woodlands are vulnerable to nutrient run-off leading to eutrophication. − Maintenance of grazing − Controlled off-track recreational activity (i.e. trampling) − Minimal air pollution – nitrogen deposition may cause reduction in diversity, sulphur deposition can cause acidification − Absence of direct fertilization − Well-drained soils
Ebernoe Common SAC	235	− Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici- Fagenion) − Barbastelle bat − Bechstein's bat	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats and habitats of qualifying species − The structure and function (including typical species) of qualifying natural habitats − The structure and function of the habitats of qualifying species − The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely − The populations of qualifying species, and, − The distribution of qualifying species within the site.	− Appropriate management. − Minimal atmospheric pollution may increase the susceptibility of beech trees to disease and alter epiphytic communities. − Absence of disturbance. − In a wider context, bats require good connectivity of landscape features to allow − foraging and commuting. − Both bat species have close association with woodland. Areas of undesignated woodland adjacent to SAC may be of most importance to population − Barbastelle require a constant humidity around their roosts; any manipulation of the shrub layer must be carefully considered.
Duncton to Bignor Escarpment SAC	212	− Asperulo-Fagetum beech forests	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation	− Minimal atmospheric pollution – may increase the susceptibility of beech trees − to disease − Appropriate woodland management

			Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats − The structure and function (including typical species) of qualifying natural habitats, and − The supporting processes on which the qualifying natural habitats rely	
Kingley Vale SAC	201	− Yew-dominated woodland − Dry grasslands and scrublands on chalk or limestone	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats and habitats − The structure and function (including typical species) of qualifying natural habitats, and − The supporting processes on which qualifying natural habitats rely	− Maintenance of grazing − The long-term conservation of the yew forest requires the maintenance of nurse scrub habitat and the regulation of numbers of resident deer. − Minimal air pollution – nitrogen deposition may cause reduction in diversity, sulphur deposition can cause acidification − Absence of direct fertilization − The site is vulnerable to spray-drift (i.e. eutrophication) from surrounding intensive arable land. − Low recreational pressure.
Mole Gap to Reigate Escarpment SAC	892	− Stable box scrub, on steep chalk slopes − Semi-natural dry grasslands and scrubland faces on calcareous substrates (Festuco-Brometalia) (important orchid sites) − Yew-dominated woodland − European dry heaths − Asperulo-Fagetum beech forests − Great crested newt − Bechstein's bat	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats and habitats of qualifying species − The structure and function (including typical species) of qualifying natural habitats − The structure and function of the habitats of qualifying species − The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely − The populations of qualifying species, and, − The distribution of qualifying species within the site.	− Recreational pressure is high and requires management and monitoring. − Neglect and a lack of appropriate grazing − Absence of disturbance. − In a wider context, bats require good connectivity of landscape features to allow foraging and commuting.

Pagham Harbour SPA/Ramsar	629	− Internationally important wintering populations of ruff, Brent goose and black-tailed godwit. − Internationally important breeding population of common tern and little tern	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; − The extent and distribution of the habitats of the qualifying features − The structure and function of the habitats of the qualifying features − The supporting processes on which the habitats of the qualifying features rely − The population of each of the qualifying features, and, − The distribution of the qualifying features within the site.	− Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze. − Unpolluted water. − Minimal recreational and other disturbance − Absence of nutrient enrichment of water. − Absence of non-native species. − Maintenance of appropriate hydrological regime. − Maintenance of isolated, open, non-vegetated sand and shingle beaches and spits for nesting. − Maintenance of suitable feeding areas in estuarine habitats and inland grazing marshes − Maintenance of suitable feeding areas with winter wheat/grass close to Pagham Harbour
Portsmouth Harbour SPA/Ramsar	1250	− Internationally important wintering populations of Brent goose, black-tailed godwit, dunlin and red-breasted merganser.	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; − The extent and distribution of the habitats of the qualifying features − The structure and function of the habitats of the qualifying features − The supporting processes on which the habitats of the qualifying features rely − The population of each of the qualifying features, and, − The distribution of the qualifying features within the site.	− Coastal squeeze arising from coastal defences and sea level rise − Modification of physical processes through large-scale land-claim, capital and maintenance dredging, sea defences and the knock on effects on the extent and distribution of intertidal habitats − Maintenance and development of both commercial and military ports − Accidental pollution from shipping and heavy industrial activities, former military and waste disposal sites, and re-distribution of contaminated sediments − High levels of recreational pressure both on shore and offshore which can have disturbance effects upon birds during sensitive (over-wintering) periods.

Rook Clift SAC	11	− Mixed woodland (ash Fraxinus excelsior, wych elm Ulmus glabra and lime (mainly small-leaved lime Tilia cordata but more rarely large-leaved lime T. platyphyllos)) on base-rich soils associated with rocky slopes	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats − The structure and function (including typical species) of qualifying natural habitats , and − The supporting processes on which qualifying natural habitats rely	− Appropriate woodland management − Deer grazing needs to be controlled − Planting inside the woodland needs to be tightly controlled.
Singleton and Cocking Tunnels SAC	2	− Hibernating barbastelle bat − Hibernating Bechstein's bat	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of the habitats of qualifying species − The structure and function of the habitats of qualifying species − The supporting processes on which the habitats of qualifying species rely − The populations of qualifying species, and, − The distribution of qualifying species within the site.	− Absence of disturbance. Tunnel entrances are covered by bat grill to prevent disturbance. − Barbastelle require a constant humidity around their roosts; any manipulation of the shrub layer must be carefully considered.
Solent Maritime SAC	11243	− Estuaries − Cord grass swards − Atlantic salt meadows − Subtidal sandbanks − Intertidal mudflats and sandflats − Coastal lagoons − Annual vegetation of drift lines − Perennial vegetation of stony banks − Glasswort and other annuals colonising mud and sand − Shifting dunes with marram − Desmoulin's whorl snail	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats and habitats of qualifying species − The structure and function (including typical species) of qualifying natural habitats − The structure and function of the habitats of qualifying species − The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely	− Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze. − No dredging or land-claim of coastal habitats. − Unpolluted water and high oxygenation. − Absence of nutrient enrichment. − Absence of non-native species. − Maintenance of freshwater inputs. − Balance of saline and non-saline conditions. − Maintenance of grazing

			− The populations of qualifying species, and, − The distribution of qualifying species within the site.	
Solent and Isle of Wight Lagoons SAC	38	− Coastal lagoons	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats and habitats of qualifying species − The structure and function (including typical species) of qualifying natural habitats − The structure and function of the habitats of qualifying species − The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely − The populations of qualifying species, and, − The distribution of qualifying species within the site.	− Maintain water quality − Maintain water salinity − Maintain suitable distance between SAC and development to allow for managed retreat of intertidal habitats − Avoid introductionof non-native species, e.g. from shipping activity
South Wight Maritime SAC	19866	− Reefs − Vegetated sea cliffs of the Atlantic and Baltic Coasts − Submerged or partially submerged sea caves	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats − The structure and function (including typical species) of qualifying natural habitats, and − The supporting processes on which qualifying natural habitats rely	− Existing and proposed coast protection works; − Coastal squeeze of cliff habitats due to erosion, development or intensive − agriculture in the hinterland; − Sewage disposal; − Accidental pollution from shipping activity; − Development in the intertidal/subtidal; − Commercial and recreational activities such as dredging and dredged spoil disposal, − fishing and boating; − Introduction of non-native species, e.g. from shipping activity; − Marine aggregate extraction (off-site).
The Mens SAC	205	− Atlantic acidophilous beech forests with Ilex and sometimes also	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation	− Appropriate woodland management. − Low recreational pressure (because management is minimum intervention and

		Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion) − Barbastelle bat	Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats and habitats of qualifying species − The structure and function (including typical species) of qualifying natural habitats − The structure and function of the habitats of qualifying species − The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely − The populations of qualifying species, and, − The distribution of qualifying species within the site.	− Bridleway degradation by horse riding is a recurring threat) − Minimal air pollution – may increase the susceptibility of beech trees to disease and alter epiphytic communities. − Barbastelle require a constant humidity around their roosts; any manipulation of the shrub layer must be carefully considered.
Thursley, Ash, Pirbright and Chobham SAC	5155	− Northern Atlantic wet heaths with Erica tetralix − European dry heaths − Depressions on peat substrates of the Rhynchosporion	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of qualifying natural habitats − The structure and function (including typical species) of qualifying natural habitats, and − The supporting processes on which qualifying natural habitats rely	− Maintenance of grazing and other traditional management practices, including bracken control and scrub clearance. − Vulnerable to the lowering of water tables as a result of water abstraction or other reasons which could cause loss or damage to wet heath and mire communities − Recreational pressures, including disturbance to wildlife and fires resulting from arson, pose a serious risk to habitats.
Thursley, Hankley and Frensham Commons SPA (including Thursley and Ockley Bogs Ramsar Site)	1880	− Nationally important breeding populations of nightjar, woodlark and Dartford warbler	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; − The extent and distribution of the habitats of the qualifying features − The structure and function of the habitats of the qualifying features − The supporting processes on which the habitats of the qualifying features rely − The population of each of the qualifying features, and,	− Maintenance of grazing and other traditional management practices. − Reduction of water levels due to water abstraction from the Greensand aquifer is affecting the wet heath and bog components of the site

			− The distribution of the qualifying features within the site.	
Wealden Heaths Phase II SPA	2057	− Nationally important breeding populations of nightjar, woodlark and Dartford warbler	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; − The extent and distribution of the habitats of the qualifying features − The structure and function of the habitats of the qualifying features − The supporting processes on which the habitats of the qualifying features rely − The population of each of the qualifying features, and, − The distribution of the qualifying features within the site.	− Maintenance of grazing and other traditional management practices. − Unfragmented habitat − Minimal recreational pressure and a low incidence of wildfires.
Woolmer Forest SAC	670	− Acid peat-stained lakes and ponds − Dry heaths − Depressions on peat substrates − Wet heathland with cross-leaved heath − Very wet mires often identified by an unstable 'quaking' surface	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; − The extent and distribution of the qualifying natural habitats − The structure and function (including typical species) of the qualifying natural habitats, and, − The supporting processes on which the qualifying natural habitats rely	− Maintenance of grazing and other traditional management practices. − Un-fragmented habitat − Minimal recreational pressure and a low incidence of wildfires. − Minimal nutrient enrichment − Minimal air pollution – nitrogen deposition may cause reduction in diversity, sulphur deposition can cause acidification
Solent & Dorset Coast potential Marine SPA (awaiting decision)		− Internationally important breeding populations of common tern, Sandwich tern and little tern.	Not available	Not available

Appendix B

Impact pathway screening of scoped in European sites

European Site	Type of site	Is there a potential impact pathway require further site specific screening?
Arun Valley SPA/SAC/ Ramsar	Riverine	Screened in. Potential impact pathway identified. Further site specific screening is required. The Arun Valley is sensitive to water quality and flows. There is a potential impact pathway of sediment entering the River Rother and ultimately the Arun Valley SPA/SAC/Ramsar site.
Ashdown Forest SAC/SPA	Heathland and heathland birds	Screened in. Potential impact pathways identified. Further site specific screening is required. • The heathland habitat of Ashdown Forest SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A275 and A22 which lies within 200m if the SAC may result in likely significant effects. • Although hydrologically sensitive, the proposed minerals sites are over 12km away and therefore there is no realistic impact pathway and this impact can be screened out.
Butser Hill SAC	Calcareous grassland	Screened in. Potential impact pathway identified. Further site specific screening is required. The woodland habitat of the SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A3 which lies within 200m if this SAC may result in likely significant effects.
Castle Hill SAC	Calcareous grassland	Screened out. Key issues relating to this SAC are specific matters of site management and recreational pressure. No potential impact pathways identified from soft sand extraction upon the Qualifying Features of this site. No further assessment required.
Chichester & Langstone Harbours SPA/ Ramsar	Estuarine	Screened in. Potential impact pathway identified. Further site specific screening is required. • Although hydrologically sensitive, the proposed minerals sites are over 12km away and therefore there is no realistic impact pathway and this impact can be screened out.

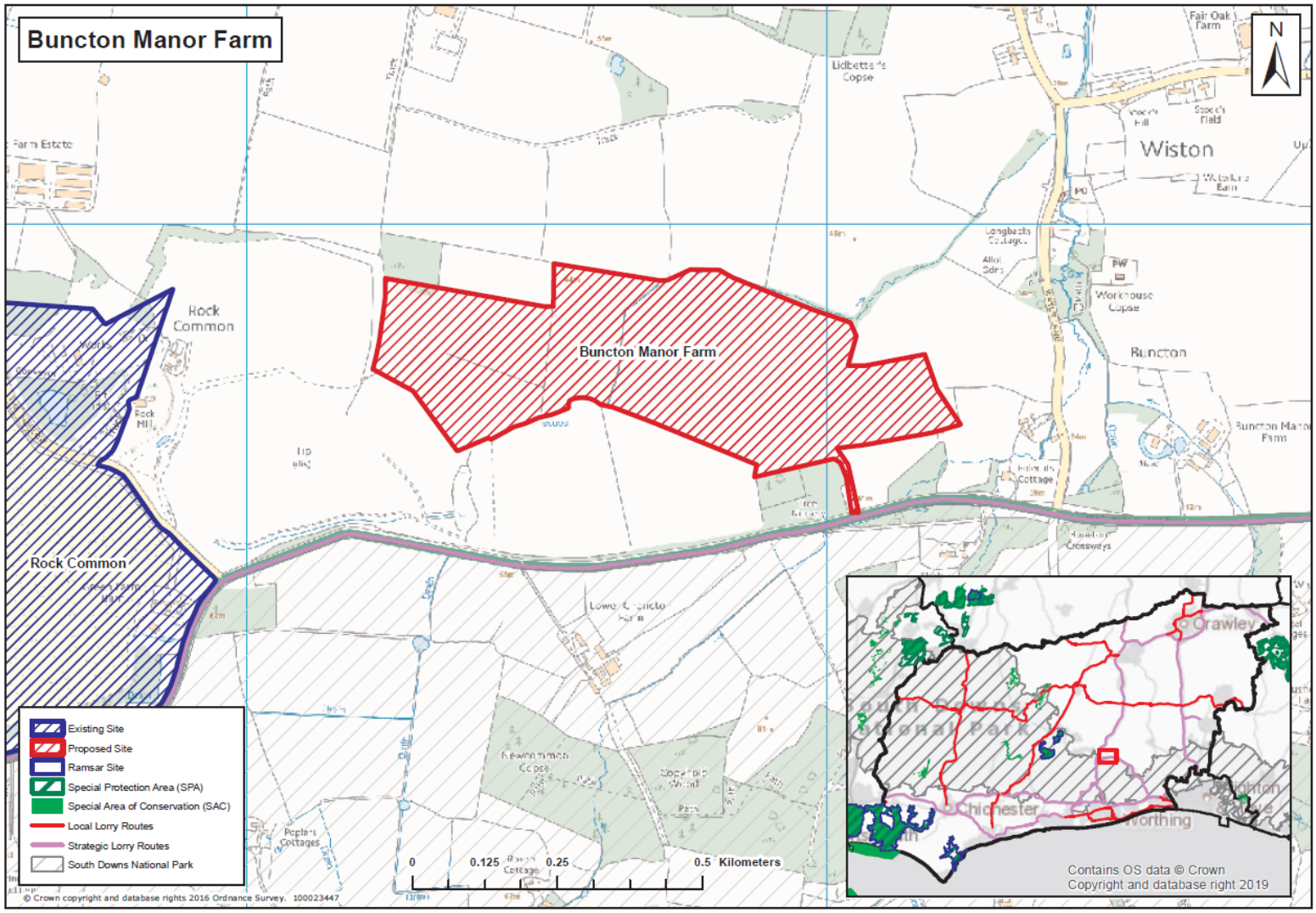
		• The habitat of Chichester and Langstone Harbours SPA/Ramsar is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A27 which lies within 200m if this SPA/Ramsar may result in likely significant effects. Therefore this impact pathway is screened in.
Duncton to Bignor Escarpment SAC	Woodland	Screened in. Potential impact pathway identified. Further site specific screening is required. Woodland and grassland habitat such as that at Duncton to Bignor Escarpment SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A285 road which lies within 200m if this SAC may result in likely significant effects.
East Hampshire Hangers SAC	Woodland	Screened out. Key issues relating to this SAC are specific matters of site management, recreational pressure and run off from surrounding areas. Due to the distances involved between this European site and potential mineral sites, there is no realistic impact pathway.
Ebernoe Common SAC	Bats	Screened in. Potential impact pathway identified. Further site specific screening is required. • Screening zones of 6.5km and 12km are used in relation to the three SACs in Sussex designated for their bats, including Ebernoe Common SAC. There is a potential impact pathway of loss of supporting habitat for roosting, foraging and commuting. • The habitat of the SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A283 road which lies within 200m of this SAC may result in likely significant effects
Kingley Vale SAC	Woodland	Screened in. Potential impact pathway identified. Further site specific screening is required. Woodland and grassland habitat such as that at Kingley Vale SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the B2141 which lies within 200m if this SAC may result in likely significant effects.
Mole Gap to Reigate Escarpment SAC	Calcareous grassland, scrub, heathland and	Screened in. Key issues relating to this SAC are specific matters of site management, recreational pressure and bats. Soft sand can only be worked where it is found and due to the distances involved between this area and the SAC, there are no impact pathways present that could impact upon qualifying features with regard to the key issues identified.

	deciduous woodland	A potential impact pathway is identified. The habitat of this SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the section of the M25 which lies within 200m of this SAC may result in likely significant effects.
Pagham Harbour SPA/ European Marine Site/Ramsar	Estuarine	Screened out. There are no minerals sites within 10km. There are no impact pathways which could impact upon the Qualifying Features of this SAC.
Portsmouth Harbour SPA/ Ramsar	Estuarine	Screened out. There are no minerals sites within 10km. Due to the distances involved, there are no impact pathways which could impact upon the Qualifying Features of this SAC.
Rook Clift SAC	Woodland	Screened out. Key issues relating to this SAC would be specific matters of site management and recreational pressure arising from housing development. Therefore no potential impact pathways identified from soft sand extraction upon the Qualifying Features of this site. No further assessment required.
Singleton and Cocking Tunnels SAC	Bats	Screened in. Potential impact pathway identified. Further site specific screening is required. Screening zones of 6.5km and 12km are used in relation to the three SACs in Sussex designated for their bats, including Singleton & Cocking Tunnels SAC. There is a potential impact pathway of loss of supporting habitat for roosting, foraging and commuting.
Solent Maritime SAC	Estuarine	Screened in. Potential impact pathway identified. Further site specific screening is required. • Although hydrologically sensitive, the proposed minerals sites are over 12km away and therefore there is no realistic impact pathway and this impact can be screened out. • The habitat of the Solent Maritime SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A27 which lies within 200m if this SAC may result in likely significant effects. Therefore this impact pathway is screened in.

Solent and Isle of Wight Lagoons SAC	Coastal lagoons	Screened out. There are no minerals sites within 10km. There are no impact pathways which could impact upon the Qualifying Features of this SAC.
South Wight Maritime SAC	Estuarine	Screened out. There are no minerals sites within 10km. Due to the distances involved, there are no impact pathways which could impact upon the Qualifying Features of this SAC.
The Mens SAC	Bats	Screened in. Potential impact pathway identified. Further site specific screening is required. • Screening zones of 6.5km and 12km are used in relation to the three SACs in Sussex designated for their bats, including The Mens SAC. There is a potential impact pathway of loss of supporting habitat for roosting, foraging and commuting. • Soft sand sites which would result in a net increase in traffic movements along the A272 road which lies within 200m of this SPA may result in likely significant effects. Therefore this impact pathway is screened in.
Thursley, Ash, Pirbright & Chobham SAC	Heathland birds	Screened in. Potential impact pathway identified. Further site specific screening is required. • Soft sand sites which would result in a net increase in traffic movements along the A3 via the A272 which lies within 200m of this SPA may result in likely significant effects. • The heathland habitat is hydrologically sensitive to changes in water quality and flows.
Thursley, Hankley and Frensham Commons SPA (including Thursley and Ockley Bogs Ramsar Site)	Heathland birds and heathland/ bog	Screened in. Potential impact pathway identified. Further site specific screening is required. • Soft sand sites which would result in a net increase in traffic movements along the A3 via the A272 which lies within 200m of this SPA may result in likely significant effects. Therefore this impact pathway is screened in. The heathland habitat is hydrologically sensitive to changes in water quality and flows.
Wealden Heaths Phase 2 SPA	Heathland birds	Screened in. Potential impact pathway identified. Further site specific screening is required.

		The habitat of the SPA is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A3 which lies within 200m if this SPA may result in likely significant effects.
Woolmer Forest SAC	Heathland	Screened in. Potential impact pathway identified. Further site specific screening is required. Heathland habitat of the SAC is air-quality sensitive. Soft sand sites which would result in a net increase in traffic movements along the A3 which lies within 200m if this SPA may result in likely significant effects.
Solent & Dorset Coast potential Marine SPA	Maritime	Screened out. There are no minerals sites within 10km. Due to the distances involved, there are no impact pathways which could impact upon the Qualifying Features of this SAC.

Appendix C


Buncton Manor Farm
N
Wiston
Rock Common
Buncton Manor Farm
Buncton
Rock Common
Existing Site
Proposed Site
Ramsar Site
Special Protection Area (SPA)
Special Area of Conservation (SAC)
Local Lorry Routes
Strategic Lorry Routes
South Downs National Park
0
0.125
0.25
0.5 Kilometers
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Crawley
Chichester
Worthing
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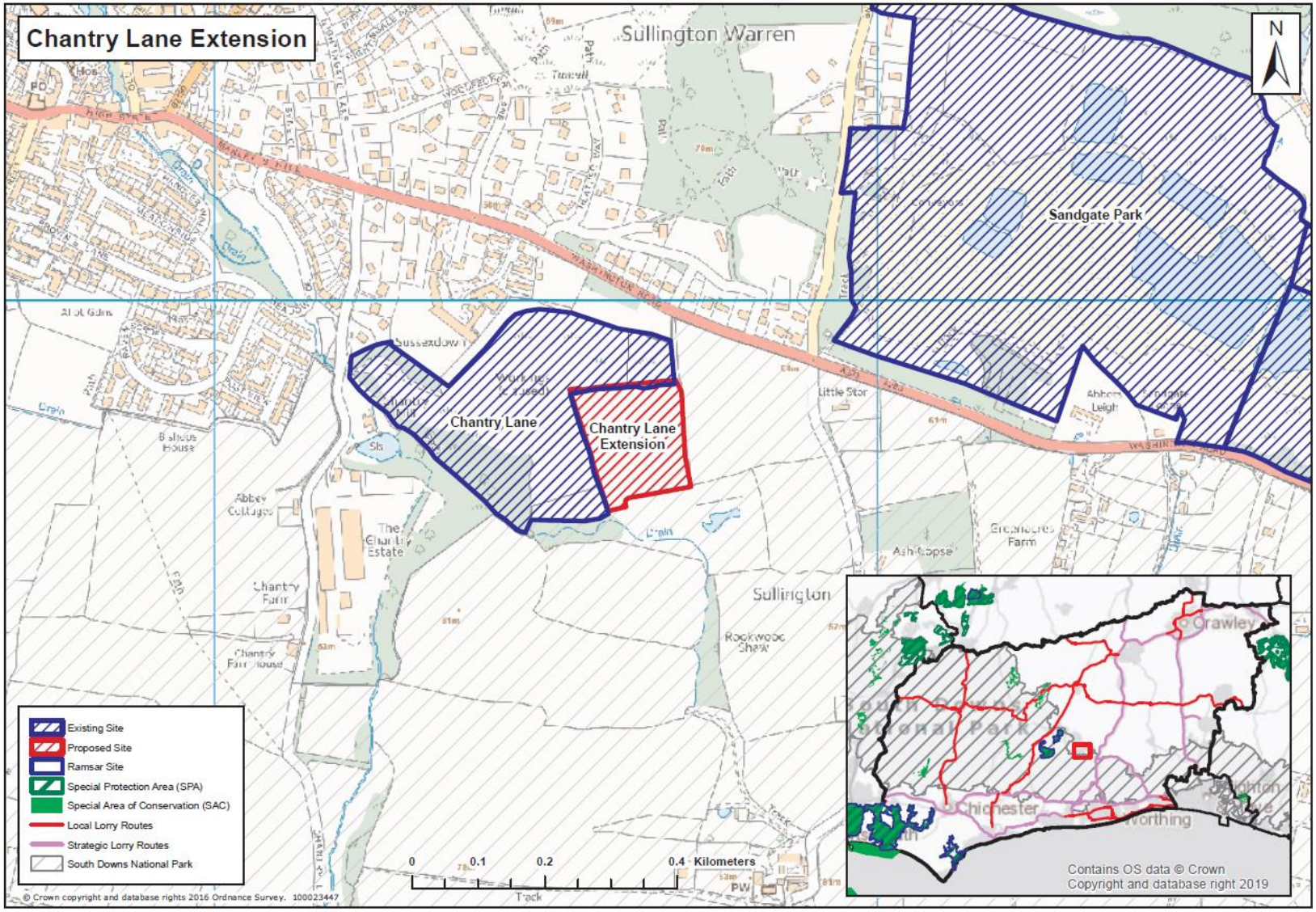
Chantry Lane Extension
Sullington Warren
Sandgate Park
Chantry Lane
Chantry Lane Extension
Sullington
Existing Site
Proposed Site
Ramsar Site
Special Protection Area (SPA)
Special Area of Conservation (SAC)
Local Lorry Routes
Strategic Lorry Routes
South Downs National Park
0 0.1 0.2 0.4 Kilometers
N
Crawley
Chichester
Worthing
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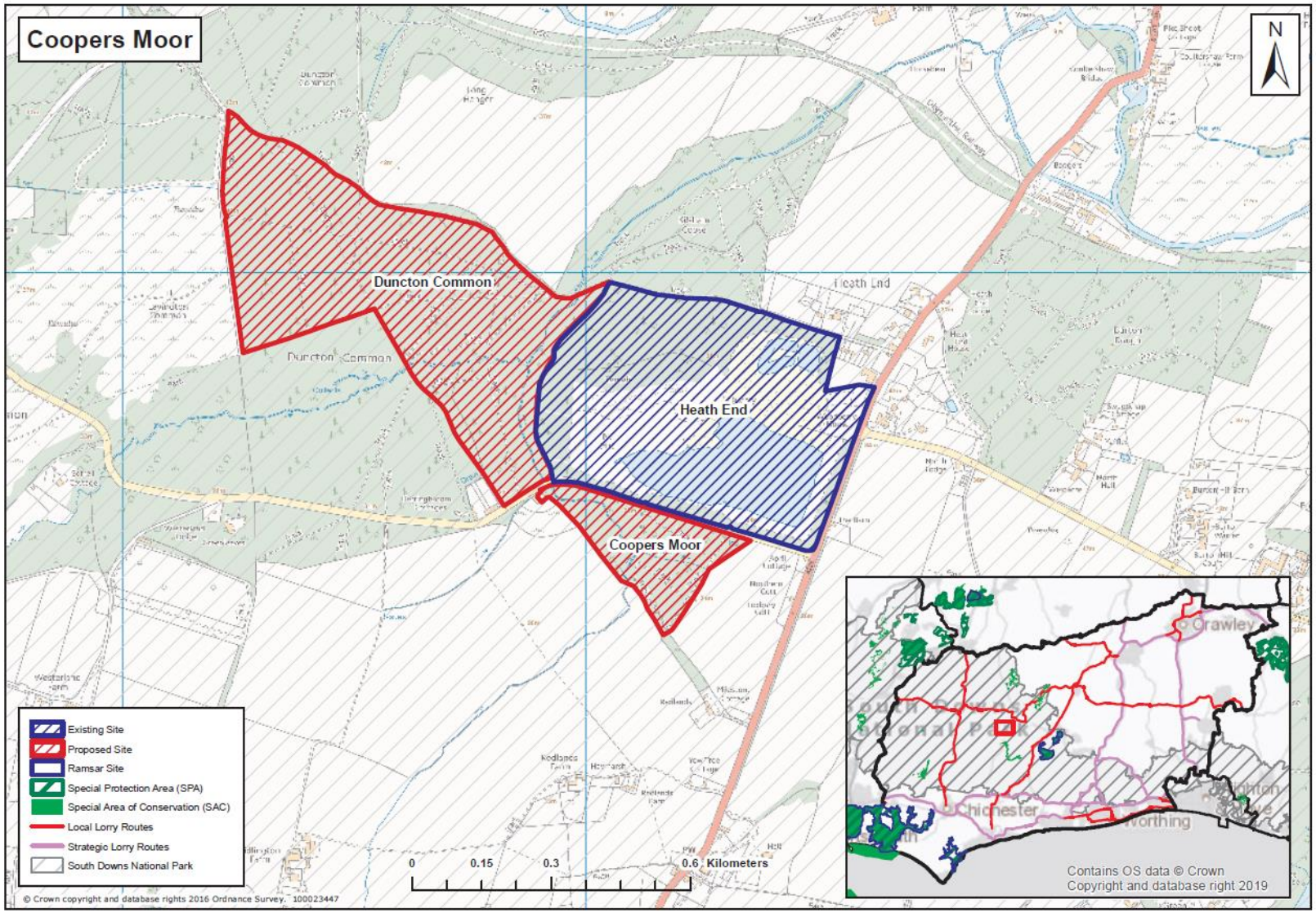
Coopers Moor
N
Duncton Common
Heath End
Coopers Moor
Existing Site
Proposed Site
Ramsar Site
Special Protection Area (SPA)
Special Area of Conservation (SAC)
Local Lorry Routes
Strategic Lorry Routes
South Downs National Park
0
0.15
0.3
0.6 Kilometers
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Crawley
Chichester
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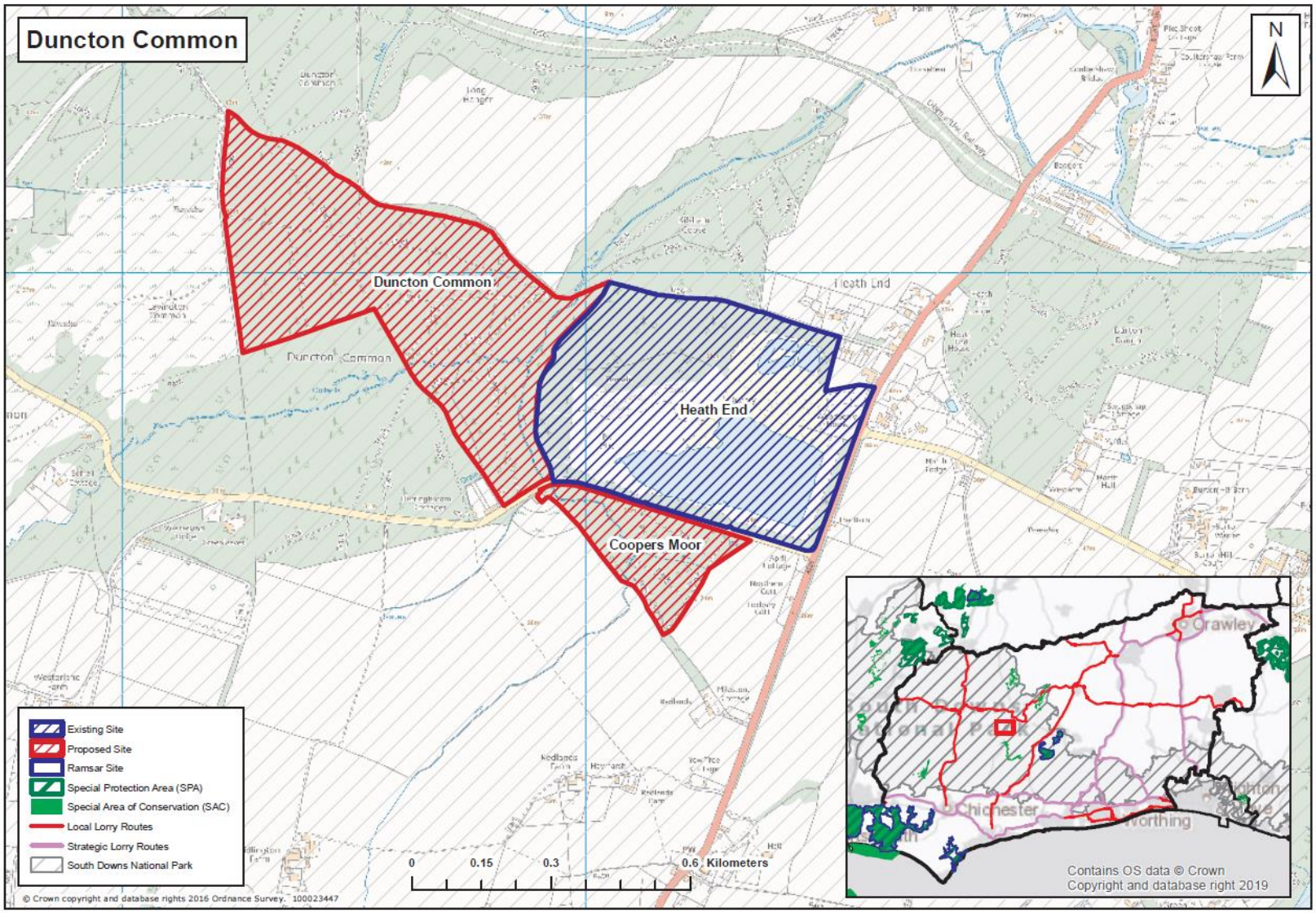
Duncton Common
N
Duncton Common
Heath End
Coopers Moor
Heath End
Existing Site
Proposed Site
Ramsar Site
Special Protection Area (SPA)
Special Area of Conservation (SAC)
Local Lorry Routes
Strategic Lorry Routes
South Downs National Park
0
0.15
0.3
0.6 Kilometers
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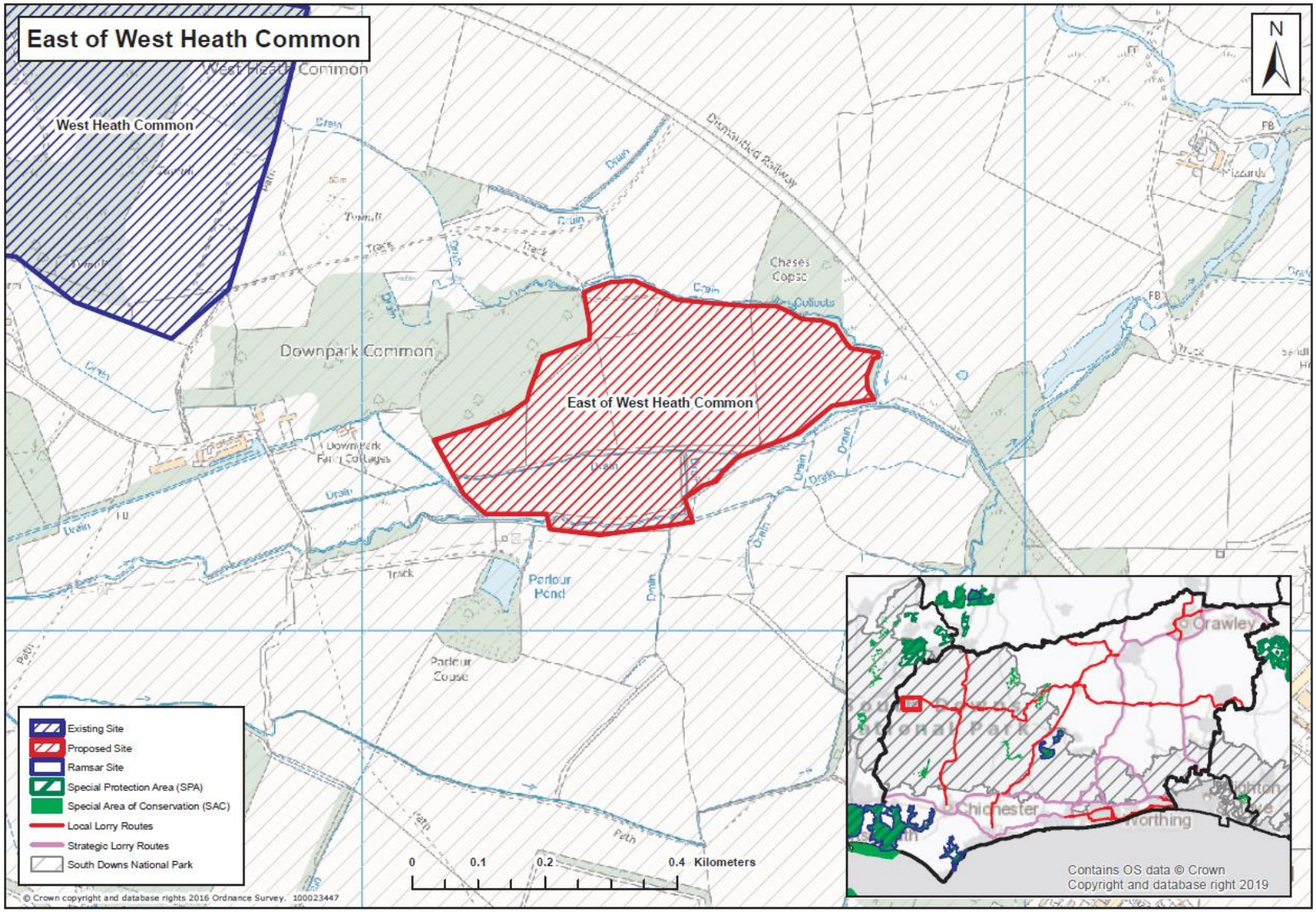
East of West Heath Common
West Heath Common
West Heath Common
Downpark Common
East of West Heath Common
Chases Copse
Parlour Pond
Parlour Copse
Downpark Farm Cottages
Drain
Track
Path
Dismantled Railway
FB
N
Existing Site
Proposed Site
Ramsar Site
Special Protection Area (SPA)
Special Area of Conservation (SAC)
Local Lorry Routes
Strategic Lorry Routes
South Downs National Park
0
0.1
0.2
0.4 Kilometers
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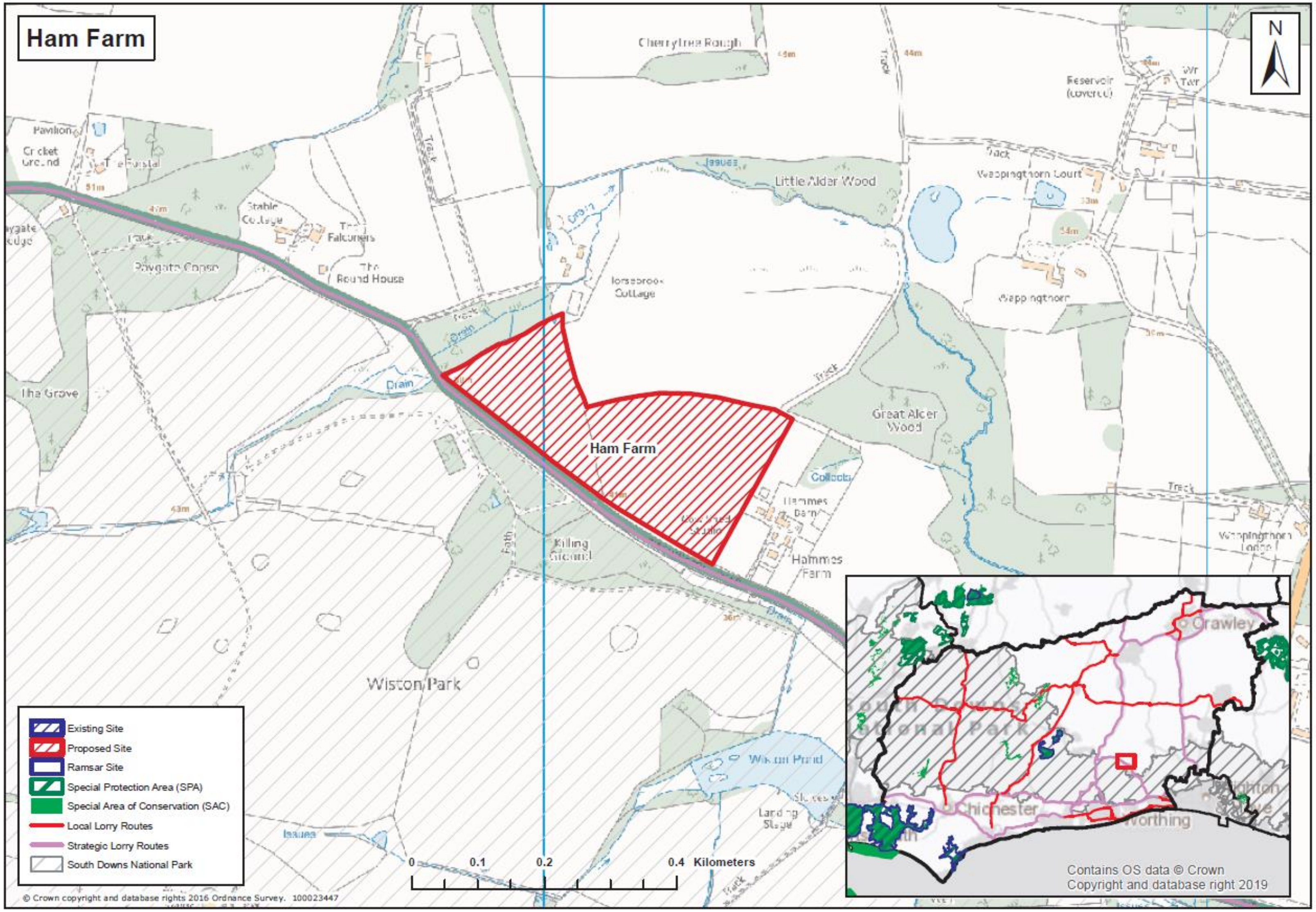
Ham Farm
N
Cherrytree Rough
Little Alder Wood
Great Alder Wood
Ham Farm
Hammes Farm
Wiston Park
Wiston Pond
Existing Site
Proposed Site
Ramsar Site
Special Protection Area (SPA)
Special Area of Conservation (SAC)
Local Lorry Routes
Strategic Lorry Routes
South Downs National Park
0 0.1 0.2 0.4 Kilometers
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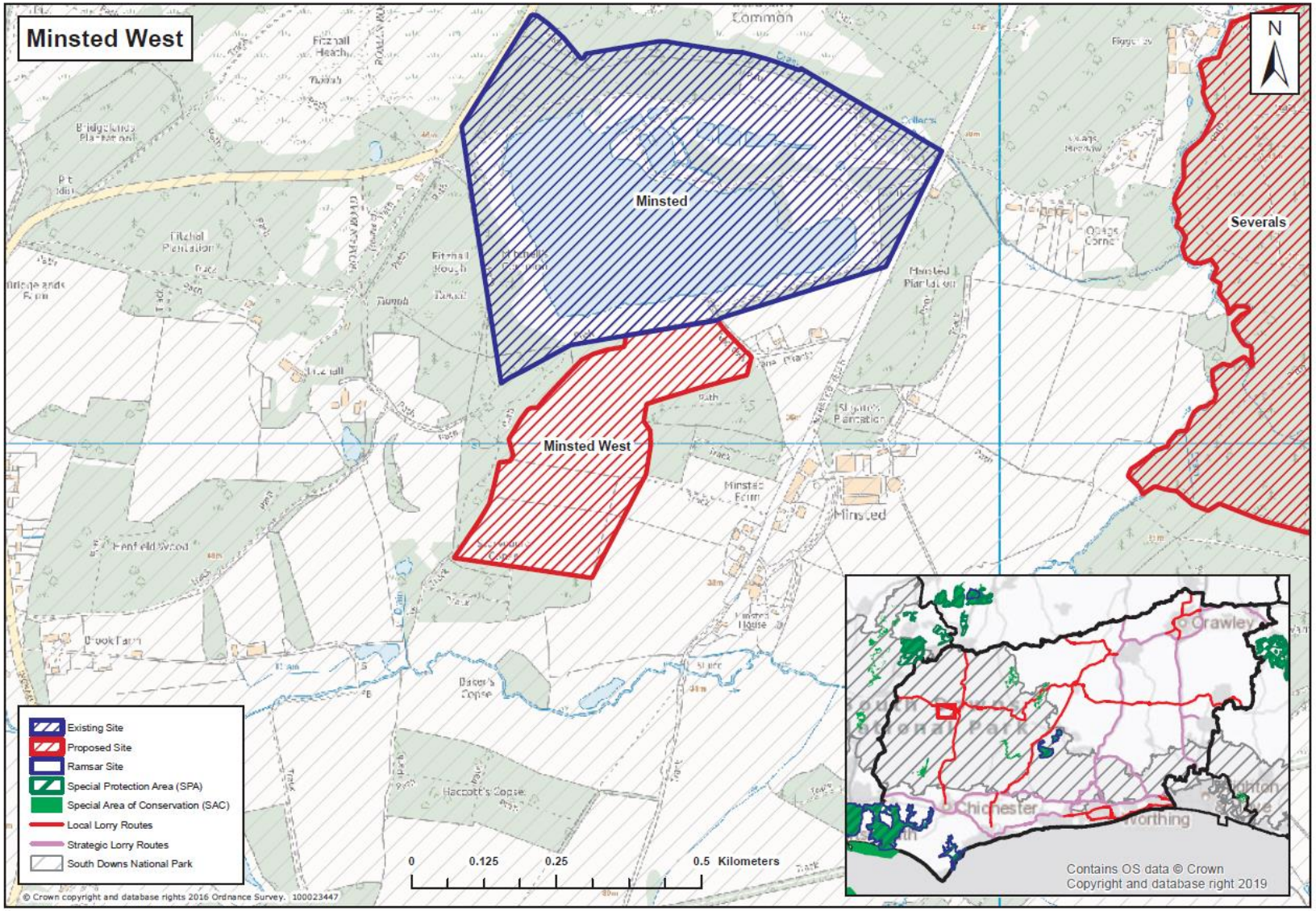
Minsted West
Minsted
Minsted West
Severals
N
Existing Site
Proposed Site
Ramsar Site
Special Protection Area (SPA)
Special Area of Conservation (SAC)
Local Lorry Routes
Strategic Lorry Routes
South Downs National Park
0
0.125
0.25
0.5 Kilometers
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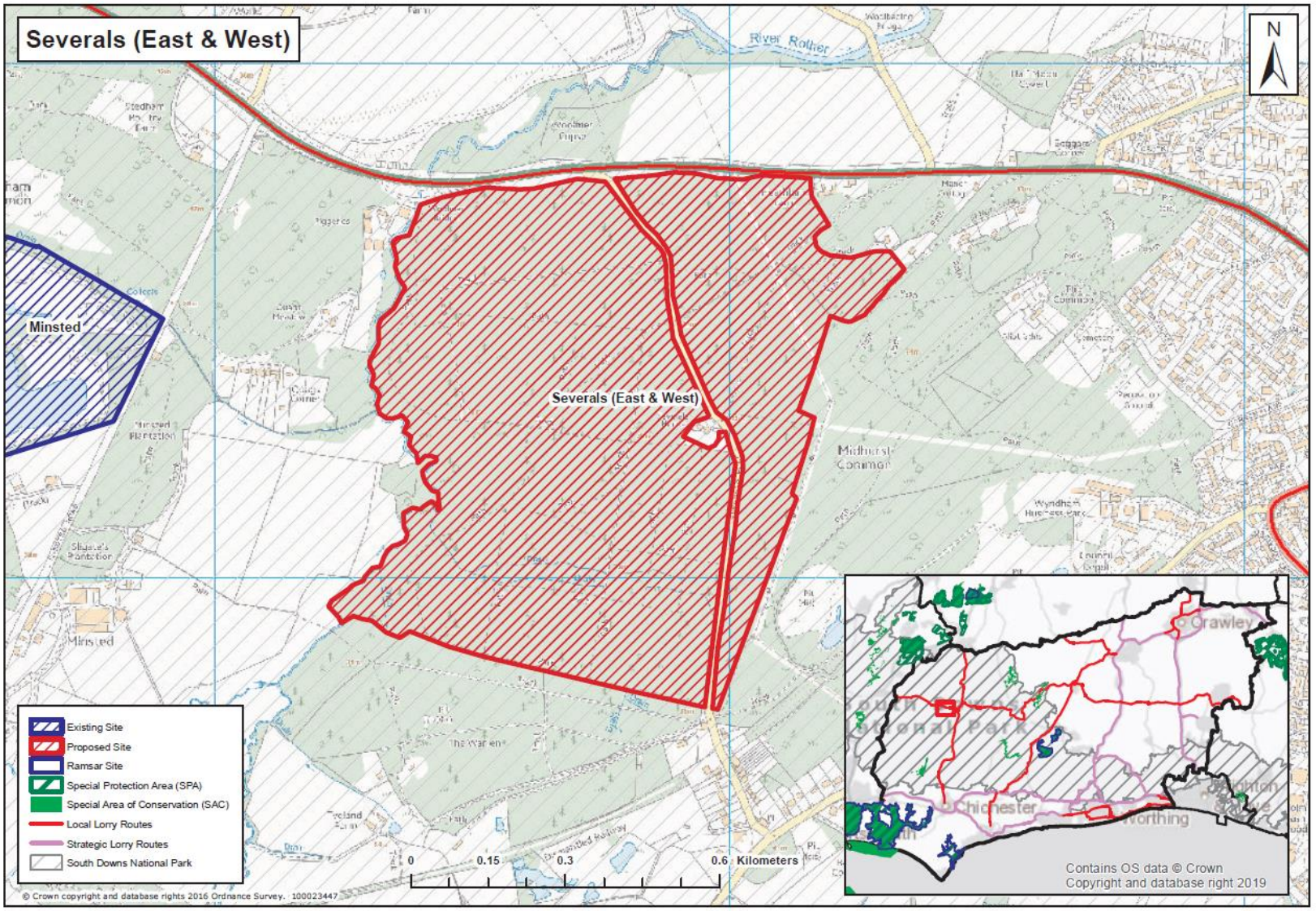
Severals (East & West)
N
River Rother
Minsted
Severals (East & West)
Midhurst Common
Existing Site
Proposed Site
Ramsar Site
Special Protection Area (SPA)
Special Area of Conservation (SAC)
Local Lorry Routes
Strategic Lorry Routes
South Downs National Park
0
0.15
0.3
0.6 Kilometers
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Crawley
Chichester
Worthing
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